JOINT STAFF WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)	
	)	Docket No.
CALIFORNIA STRATEGY TO REDUCE PETROLEUM DEPENDENCE	)	01-SRPD-1
	)	

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET

HEARING ROOM A

SACRAMENTO, CALIFORNIA

WEDNESDAY, JANUARY 16, 2002

9:37 A.M.

Reported by:
Peter Petty
Contract No. 150-01-005

COMMISSIONERS PRESENT

William J. Keese, Chairman

CEC STAFF PRESENT

Susan J. Brown, Manager, Transportation Technology and Fuels Office

Daniel W. Fong, P.E., Transportation Technology Specialist, Transportation Technology and Fuels Office

Leigh Stamets

David Ashuckian

Chris Kavalec

ALSO PRESENT

Alan C. Lloyd, Chairman,
California Air Resources Board

Paul Wuebben, Clean Fuels Officer, Science and Technology Advancement, South Coast Air Quality Management District

Michael D. Jackson, Associate Director, Transportation Technology, Acurex Environmental, An Arthur D. Little Company

Sandra A. Spelliscy, General Counsel
Planning and Conservation League

Russell Long, Executive Director
Bluewater Network

David A. Smith, Director, Legislative and Regulatory Affairs, Fuel Issues
bp Amoco Corporation

Tim Carmichael, Executive Director
Coalition for Clean Air

Frank J. Mazanec, Senior Vice President
Onsite Energy

ALSO PRESENT

Richard McCann, Partner
M.Cubed

Neil Koehler, Kinergy Resources

Jim Larson, Senior Program Manager, New Energy Markets, Pacific Gas and Electric Company

Roland J. Wong, Senior Policy Analyst, Natural Resources Defense Council

Rich Ferguson, Center for Energy Efficiency and Renewable Technologies

Todd R. Campbell, Policy Director
Coalition for Clean Air

John C. Keller, Senior Planner
California Highway Patrol

Sean H. Turner, President
California Natural Gas Vehicle Coalition

Mitja Hinderks
Litus, Inc.

Patricia Monahan, Senior Analyst, Clean Vehicles Program, Union of Concerned Scientists

Zach Church, Principal Assistant
Speaker Pro Tem Fred Keeley, 27th Assembly District
State of California

Staci Ellis, Manager of Environmental Affairs
California Trucking Association

Jerry Pohorsky
The Pohorsky Group

Douglas P. Wheeler, Attorney, Hogan & Hartson, LLP
The Diesel Technology Forum

Daniel Emmett, Energy Programs Coordinator
Environment Now Foundation

Doug Whitehead, Deputy Director
National Biodiesel Board

ALSO PRESENT

Robert Lucas, Attorney
Lucas Advocates
California Council for Environmental and Economic Balance

Pam Jones
Diesel Technology Forum

I N D E X

I N D E X

P R O C E E D I N G S

9:37 a.m.

MS. BROWN: I'm very pleased at this time to introduce the California Energy Commission Chairman Bill Keese, who has a few opening remarks to kick off this workshop.

CHAIRMAN KEESE: Good morning, everyone. We welcome you here to our workshop at the California Energy Commission. I'm really pleased that Chairman Alan Lloyd can join us to receive the input you're giving us on our strategy for reducing petroleum dependence.

Commissioner Michal Moore will be joining us during the day. He's not present at this moment. He is the Second Member on our Fuels Committee at the Energy Commission.

As you're all well aware AB-2076 directs the California Energy Commission and the Air Resources Board to develop and submit to the Legislature a recommended strategy on ways to reduce petroleum dependence in California. This report is due to the Governor and the Legislature by April 30, 2002.

This is the second workshop staff has conducted, and we're planning on conducting a

third workshop next month. This workshop is a step in the analytical process to evaluate those strategies that have the greatest potential impact to reduce petroleum dependence, along with the cost and benefits of each.

The issues are very complex. There are many viewpoints to consider. The results of this workshop will undoubtedly affect everyone, every citizen of the state.

A little background here. California gasoline demand is forecasted to top 15 billion gallons by 2004, rising to over 22 billion by 2030. Demand for jet and diesel fuels also remains strong, and will, over the next three decades.

This growing demand will increase the social and environmental costs associated with its use. At some point in the future we know that conventional oil supplies will decline. We differ, there are many different scenarios for that decline and depletion.

Achieving a significant reduction in petroleum dependence will require a combination of policies and strategies by 2010, by 2020 and beyond. The introduction of new fuels, advanced

vehicles such as fuel cell and hybrid electric vehicles, smart growth strategies and consumer demand measures all can play a role.

We recognize there is no single solution to California's petroleum dependence. Yet it is the task before us to develop a strategy that is thorough, honest, objective and clear and defensible analytical foundation. We cannot do this effectively without your participation.

As you will see in presentations that follow, the staffs of our two agencies have prepared a large body of work. We are at a point in the process now where we need your input and advice, both from private industry and from government experts outside of our agencies.

For that reason I am asking that all of the major stakeholders come together to support this unprecedented work of our two agencies in response to Assemblyman Shelley's direction for the State of California.

It's my pleasure to introduce Alan Lloyd.

CHAIRMAN LLOYD: Thank you very much, Chairman Keese. Again, I would like to thank you and Commissioner Moore for allowing us to work so

closely on this joint effort. I think you captured it extremely well. I think it is a very important effort. I think we have a unique opportunity here for the energy scenarios in California and also for air quality and public health.

My goal on this is to see that as we labor along here that, in fact, we don't have an elephant giving birth to a mouse. And so this is going to be very important as we move ahead to come up with something meaningful.

I think you highlighted the continued instability in terms of the sources of oil; how that may affect us. We've seen recently, of course, low oil prices again; something we didn't think we'd see maybe six or nine months ago. But we realize that's only a transitory part there. And so the ability to supply gasoline and diesel to California, given the constraints of supplies, the growing demand in developing countries puts, in fact, a great strain on California and the need that we look out well ahead where we're going.

Also, I think the lack of action on CAFE is one that also means that we have to be even more aggressive in terms of our planning here. I

think we need to look 20 to 50 years ahead to in fact look at the impact of various technologies, because I think, as you indicated, we recognize that petroleum supplies are going to be running out. It's not a question of if, it's a question of when.

Also the question is are we making the best use of this valuable resource in petroleum. Can we use something else, can we use more renewables.

I think the growing evidence of the impact of CO2 and other emissions on climate change and the linkage of climate change to public health that we're particularly interested in. As an example there we see the Mayor of Tokyo now talking about imposing a carbon tax for vehicles in Tokyo. And that's got major implications for vehicles and driving habits, et cetera.

I think the report here will be extremely timely. I think, as I said before, we really have a unique opportunity. We have technologies available today to help us in this quest. We've got more efficient internal combustion engines. We've got drive trains, for example, continuously available transmissions

there.

We've got the leadership in hybrid electrics showed by Honda and Toyota. We're not talking about something coming out of PNGV, we're actually talking about vehicles that you can buy today.

Got the recent Honda vehicle with natural gas, and the opportunities that natural gas can provide in terms of clean, efficient transportation in both the light duty and heavy duty sectors.

We have the alternate fuels, as well; opportunities there. The alcohol, which can help us. And then we've got also the battery electric vehicles, which, as you know, we've been pursuing, in various styles, shapes and forms.

And then I think we're also witnessing at this time and with recent announcements worldwide the opportunities for fuel cells. And I think we're all, I think both of us are really proud to be part of the California Fuel Cell Partnership announced by Governor Davis in April 1999, involving all the auto and energy companies; and providing opportunities for us here to capture the benefits of that technology. And to

ultimately get into a hydrogen economy.

And the hydrogen economy is good because you can get hydrogen from all the fuels I mentioned above.

So, I think that as we look forward, I, similar to you, Chairman Keese, I think am looking forward to working with staff, getting the input from all of the people in California. We're going to need that and from all segments.

And I think only with that input, only with diligent work are we going to be able to live up to the expectations that many people have from the legislature which is most important. But I think both of us obviously feel obliged that we provide Governor Davis with the document and the planning tool that, in fact, is deserved by the public at this time.

CHAIRMAN KEESE: Thank you very much. I will just say, this is California focused. It's very California focused, but on the federal level we see things like the hydrogen impetus, which is positive in my view.

We see some things on CAFE which are positive. We see some things on CAFE that are not positive. But at least at the federal level

they're starting to talk about this issue.

So I think that makes the timeliness of what we're doing here far more important. Perhaps what we come up with can also have an impact on the federal level after we're done, recognizing we're not going to seek a national focus for this study, but a California focus.

Thank you very much for joining us.

MS. BROWN: And thank you both for those wonderful introductory remarks. My name is Susan Brown and I'm just going to take a few minutes this morning to briefly review the legislative requirements of Assembly Bill 2076, and then I'm going to be walking us through what the agenda for today's workshop is.

First of all the legislation requires a joint report by the Commission and the Air Board. The legislation action set a deadline of January 31st of this year. However, Assemblyman Shelley has granted us a 90-day extension, which we are convinced we need to achieve the legislative requirements. So that brings us to April 30, 2002.

Three parts of the requirements. Basically we have a strategy, a forecast and

goals. And today we're really going to be focusing on some preliminary analysis of the strategies.

I might also add that the legislation arose from an effort by the Attorney General's Office to address issues surrounding fuel price volatility. And we are going to be talking today about the rising demand for petroleum and the limits on the state's refinery at a time when petroleum demand is growing at a rate of about 2 percent per year.

Recommended strategies. The legislation specifically mentions transportation energy efficiency, the use of nonpetroleum and alternative fuels, and the use of advanced transportation technologies. This is right out of the legislation.

And I might also mention that this same bill also asks the Commission to evaluate the feasibility of a petroleum product reserve in a separate study. And that reserve is not a part of this workshop because it's part of a parallel staff effort here at the Commission.

The workshop for today, there are detailed agendas in the back. I hope you've all

picked one up. I'm going to be serving as your sort of Mistress of Ceremonies today.

We've already done the welcome. I'm going to essentially introduce our first speaker. We're going to talk about the program plan, which is also on the website, if you're interested in the details. The demand forecast, which are an essential requirement of the bill. The problem statement. And then we'll be dealing with specific petroleum reduction strategies, by groups, starting in the afternoon. And then I have a very brief set of closing remarks to close out the day.

We expect to take a break around 12:00. I'm also going to mention that I'm going to allow time after each speaker for public comments. I'm going to invite you to come up to the lectern and identify yourself for the record and ask questions of the various presenters.

So, with that, it's my pleasure to introduce Mike Jackson, who is our consultant on this project, with Arthur D. Little, who will make the first presentation.

MR. JACKSON: Thank you, Susan. My objective in this presentation is to walk through

the effort that the Air Resources Board and the California Energy Commission have put together in terms of trying to address the intent of the legislation.

So what I want to try to cover here in this brief presentation is to kind of set the problem up a little bit, talk about demand for gasoline and diesel; then talk about the roles of the various agencies; how we've divided the work in terms of the task structure.

And then I want to talk about two specific tasks that we have taken on, and really there's three tasks, but these two specific tasks really get into the methodology of how we're going about looking at comparing these various strategies that would reduce, displace or otherwise change the demand for gasoline.

And then I want to end with some program milestones here so you can get an idea of the schedule, where we're at, where we're going to seek additional comment. And then I'll open it up for questions.

So, with that in mind, this chart here gives you an idea of what we're sort of faced with here in California. What I'm showing here is fuel

demand, billions of gallons of equivalent gasoline. So I've added the diesel use in California with the gasoline use. And this is all onroad type activities.

And I've shown here about where the current California refining capacity is. In other words, we're running nearly at capacity today. And in the outyears, going to 2030 on this chart, you can see the demand growing upwards to 30 billion gallons of gasoline equivalent per year need.

And the question we have before us is how are we going to meet that demand. One thing we could do would be to lower that demand, lower the curve, i.e., reduce the demand.

Another thing we could do would be to displace it, say with an alternative fuel like natural gas.

Or another thing we could do is import a lot of refined products. If the capacity of our refineries are the same it's not going to do us any good to import more crude oil. We'll have to import the refined product at this point.

So that's what we've faced with. That's the question we're asking here is how do we come

up with strategies that will fill up basically that triangle in terms of the demand. That's the goal that we have set before us analytically.

We have tried to use and organize this project along the lines of the expertise of the various agencies. Shown at the top here is enabling legislation, and it's really a joint California Energy Commission and Air Resources Board effort on looking at this whole issue on petroleum dependency.

Left-hand side you see CEC's, and on the right-hand side you see ARB's efforts. And the idea here was to draw from the agencies their expertise.

The CEC is taking the lead on identifying various strategies; analyzing those strategies; and performing detailed cost analyses.

ARB is assessing the environmental benefits. So not only do we want to look at sort of the direct, but we want to look at the external effects of various strategies. Assess the environmental benefits, and then to also look at what happens to the California economy using a fairly sophisticated code, which I'll talk about in a minute. What happens to the California

economy when you place some of these strategies into play.

Those efforts are then combined into trying to come up with reasonable goals or reasonable strategies that will establish various goals that we could reach in terms of petroleum reduction. Evaluate those policies, and then issue recommendations in a report to the Governor and the Legislature. And that's going to be an iterative process.

The task structure shown here, the effort that we've really concentrated on is the top line. I'm going to walk through the tasks first, then I'll walk back through it and tell you where we are.

The first task, which is the one that ARB is taking the lead on, has to do with determining the benefits of reducing the demand for gasoline. These are mostly the environmental benefits, and I have another slide on this that I'll talk about in a minute.

Task two is really the problem definition. What is the forecast. How much fuel are we going to use in the future. What's the population going to be. Do we expect any

difference in terms of what the driving public will do in terms of VMT, vehicle miles traveled. What do we expect in the future. That we're going to talk about today in some detail.

Task three is the CEC-led effort where they're looking at a detailed analysis of the various strategies, and again I'll have another slide on that in this presentation. I'll go over it. But today we're going to spend quite a bit of time on that.

So mostly today is going to be focusing more on what the forecast is; where we think we'll be in the 2020, 2030, 2050 timeframe in terms of demand, population, those things, kind of sets the background; and also today we're going to focus on the various strategies, where we are in terms of the analysis of those strategies. But not look at the environmental benefits or monetize those environmental benefits.

So this is one half of the picture. You're going to get the other half later, but this is just one half, and this is where we're seeking input is on that half.

The tasks one, two and three then feed into a task four shown on the left-hand side here

where we're looking at the various methods, goals and policies that we could do to reduce petroleum reduction.

And real important here is you guys here in the audience, public input. We're seeking that. And I think we need that throughout this process, and there's going to be a number of places for you to do that. Not only formally in a setting like this, but also informally through putting comments into the docket which is on CEC website. We'll give you that website later if you don't have it.

And then finally this comes out with a recommendation to the Governor and the Legislature. And you can see on the right-hand side that we plan to do a full reporting of this, not only from an executive summary, but trying to have various volumes that will focus on various parts of this process.

For example, volume one will deal with the benefits of petroleum reduction, so it will focus mostly on the task one effort; whereas volume three will deal with policies and recommendations, so that's mostly the task four effort.

So that gives you an idea of the process of how we're going to divide up the work; who's going to do the work; what sort of outputs we expect at the various places of the work; and what kind of reporting will come out of this.

Now let me just go through in some detail task one, which is the ARB-led effort. And then I'll talk a little bit about task three after that.

The environmental and economic impacts we've divided into roughly four categories, and they're not all environmental, but this is just a convenient way of trying to group everything that we could think of that would either have some sort of impact on the strategies that we're looking at.

So the major categories we're going to look at is air impacts, multimedia, economic and other transportation.

The air impacts we're going to divide up into criteria pollutants and toxics and global warming. And for the criteria pollutants, the toxics, we're going to use an established ARB type response methodology that's been used in a number of their regulations.

For global warming, we're still

struggling with that a little bit, but we're probably going to have some sort of equivalent CO2 emissions. We're going to track the emissions for these various strategies through their life cycle. Not only CO2, but all the other potential warming, such as CH4, methane and N2O, nitrous oxide, and come up with equivalent CO2 emissions. And then the question is how do you value those CO2 emissions. And that's going to be part of what we talk about in the February workshop, which I'll talk to you later about.

Other multimedia impacts. We have spillages and things like that that might happen during the transport of various fuels. We're going to try to put some dollar amount or monetize some value associated with those events.

And then on the economic impacts we're going to use a computer program that was developed by the Department of Finance. This is a general equilibrium model, it's a steadystate model, basically. It's going to look at one point in one year. But we're going to do a lot of what-if scenarios around those points in time and find out what happens to the California economy if you have certain impacts.

If, for example, instead of having 35 billion gallons of gasoline needed in a year you could reduce that to 20 billion gallons. And then what's the impact if you have various price variations of fuel price or oil price around that.

So that's the gist of that. We're going to try to quantify as best we can how these strategies would affect the California economy.

And then there's other transportation-related impacts that we have on here. For example, there might be some strategies that would make it cheaper for the consumer to drive their vehicles. Therefore, they might drive their vehicles more. Well, there's more VMT; more VMT means there's more cost to our roads and things like that. And we're going to try to come up with some estimates associated with that.

Task three, which is a CEC-led assessment is -- the objective here is to try to look at all the various strategies, there's a whole list here on the left-hand side of this chart; look at them in various categories. Efficiency, displacement, pricing and other type of strategies. And to take those strategies and use, as best we can, a common methodology

framework to analyze them so we can compare them.

Now, this isn't completely possible because many of these strategies are different. But we're going to do the best we can. And also it's not completely possible because some of the strategies you're looking at are -- you can look at relative to what happens on sort of near term. And we have a pretty good analysis tool on the near term. But there's some that are way out there that are going to be more scenario, what-if type scenarios analysis.

And the objective here is to try to characterize as best we can what the cost, the range of cost for these strategies. And the range of benefits or petroleum reduced for these strategies.

We know that we won't be able to accurately predict one single number, so we know there's going to be a range, and we know that there's going to be uncertainties. We want to know what those uncertainties are. We want to define what those uncertainties are. We want to define what the critical paths of these various strategies are. What needs to happen to make that strategy work. And when does it need to happen.

So we can give that kind of information to the policy makers, and they can weigh these type decisions and see what makes the most sense.

All right, program milestones. I have identified nine here that the public would potentially -- that you, the public, would potentially want to participate in.

We've already done the first one, that was petroleum reduction strategy workshop, which was held on September 17th and 18th.

We're doing the workshop today on the basecase. And on our preliminary analysis of some of the petroleum reduction strategies. And we're asking for your input on that.

Those results are going to be written up in a draft report which is going to be available on January 31st. And we're going to ask for your input on that report.

You're going to see a lot of the details today; you're not going to see all of them, but you're going to see many, at least the assumptions.

Item number four here then is the workshop. We're going to do a workshop which will review those results that you'll see in that

report on January 31st. So it will be the final petroleum reduction strategies and give you, hopefully, a good overview of what the environmental impacts are and how we have monetized those various environmental impacts.

And we can start then to put the two pieces together. The strategies, what they cost, what their petroleum reduction is, and how do they affect, impact environmental, economic kind of issues.

Item five is our goal for when we'll have the impact analysis draft report available. Six is the draft final report, which if you go back and remember that one slide, that will then include the executive summary and all the volumes by April 5th.

And then there's a series of approval or formal public hearings that go along with getting the results to the Governor and Legislature. Seven is the CEC Fuels Committee, which is now scheduled for April 15th; the ARB hearing on the 25th. And then the CEC business meeting on the 1st of May.

So that concludes sort of the overview, kind of gives you some context of the work that

we're talking about here. And really the focus this afternoon, or this morning and this afternoon, is going to be on the forecast and what are the various strategies that we have thought about in terms of reducing and/or displacing or taking care of petroleum.

So, I'll open it up for any questions. And if you could use the mike that would be great.

Everybody understands completely?

MS. SPELLISCY: Hi, my name is Sandra Spelliscy with the Planning and Conservation League.

I just had a question. You touched a little bit on, when you were sort of doing economic and environmental impacts of the different strategies, and it seems like you're looking somewhat at sort of the no-change option.

But I'm just wondering if there is and how much you're going to be taking a look at if nothing is done, you know, if there's no change in terms of demand reduction or switch to fuels or whatever, on terms of impact on the economy and impact on the environment. I just wasn't clear how much focus there was on that.

MR. JACKSON: Yeah, at least in our

economic model there's a baseline case that says if these things -- here's what the economy looks like in 2000. Here's what it will look like in 2020. Here's what it will look like in 2050 with these assumptions. Higher population, higher VMT, higher per capita income, you know. And it's all based on the best guess we can do with those assumptions.

MS. SPELLISCY: Um-hum.

MR. JACKSON: So the answer is yes, we'll look at that from that perspective.

Now, from the perspective of the environmental benefits, there's a couple of major assumptions we're making. One is that the regulations, for example, that ARB currently has in place and, will put in place in the outyears, are going to bring us to attainment.

So we're not going to do the scenario where we're going to second guess the regulations that we're already putting place.

MS. SPELLISCY: Um-hum. But for instance on the graph where you show, you know, refining capacity versus projected increase in demand, if are you looking at the scenario of if all of the increase was made up through increased

refined product, as opposed to any other changes. What the --

MR. JACKSON: Oh, only in the sense that we're assuming that the refineries are not going to be built here in California. So they're going to be built somewhere else.

MS. SPELLISCY: I guess I'm just trying to get a better sense of if, you know, how much information --

MR. JACKSON: So once --

MS. SPELLISCY: -- how much information there will be about what if we do nothing what impacts are we facing?

MR. JACKSON: Right, that there will be, that will be one of the cost/benefit cases, if you do nothing. But there's a whole different -- there's many possible scenarios that you could do for just that case alone.

MS. SPELLISCY: Um-hum.

MR. JACKSON: And we're not going to do all those scenarios.

MS. SPELLISCY: Um-hum.

MR. JACKSON: We'll just do a couple of those.

MS. SPELLISCY: But the main one you

show in your graph is, you know, a fairly dramatic increase in importation of refined product.

MR. JACKSON: Correct.

MS. SPELLISCY: And that you're looking at?

MR. JACKSON: Yes.

MS. SPELLISCY: Okay.

MR. JACKSON: And we'll look at the environmental impacts of that.

Okay, thanks for your attention.

(Pause.)

MR. JACKSON: All right, at this point in the agenda we want to move to the petroleum demand forecast. And I just want to say a couple words here and kind of introduce the timeframe that we're talking about.

The presentations are going to be done by Leigh Stamets of the Energy Commission and then Paul Wuebben of the South Coast Air Quality Management District.

Again, to put this kind of in perspective, what we know, what we don't know, what we think we know and who in the heck knows.

Obviously history we know pretty well, at least some people think we know. This shows a

plot of millions of gallons of gasoline and diesel in terms of historical 1982 to 2002. You can see in '82 we were at about 10 thousand million gallons of gasoline. And we were growing to about 15 billion gallons of gasoline in the 2002 timeframe.

Projected CEC, the California Energy Commission has a fairly good robust projection analytical techniques to take us out about 20 years, and Leigh Stamets is going to talk about that period.

We also feel fairly comfortable with that methodology taking us out to the 2030 timeframe. So that's the reason I've sort of broken it up this way, that existing methodology that CEC or the Energy Commission usually used goes in 20-year increments. But even looking at that methodology if we take it out another ten years we don't feel so uncomfortable with it.

When we get out to the 30 years out and above then we start to think, well, can we really use that kind of technology. Can we just straight-line the lines there, sort of speak, and say that's going to be our projection.

I think you need to start thinking a

little bit more about some of the fundamental shifts that may occur in society. And for that discussion Paul Wuebben is going to give us a little overview on how that might impact where we are.

So, at this point I'd like to introduce Leigh Stamets, California Energy Commission.

MS. BROWN: Is that better? Can folks see in the back now? Let me just announce that additional copies of all of these presentations will be available on the back table outside. And these will also be loaded on the website, so you don't need to take copious notes.

MR. STAMETS: Good morning. First I'd like to say that in addition there are copies of the forecast writeup in the green report that was on the back table. And it's also on the Commission website.

I would also like to, in particular, acknowledge, although there have been many people contribute to this forecast, I'd like to acknowledge Chris Kavalec and Brian Covi, who have made special input on the model runs.

As has been mentioned, the basecase forecast are our best estimate of the future

petroleum demand is one of the requirements of the 2076 legislation. So I'm going to briefly talk about the historical demand, the factors that are affecting our future forecast, the methodology and then the results of the forecast.

This slide in thousands of barrels per day basically shows the historical trends in the -- you can see it's predominately gasoline in transportation petroleum demand. And each fuel type has grown over time with the exception of the residual fuel, which is used for bunker fuel for shipping. And that primarily reflects the fact that the ships purchase their residual fuel in other countries.

This is again showing specifically the demand relative proportions today. Of course, gasoline is our main transportation fuel. Jet fuel is basically the fastest growing of the transportation fuels in the long term. And then the diesel, also.

These are the important parameters that affect our forecast of future petroleum demand in the state. We're using the Department of Finance numbers for population growth. This is 1.4 percent a year, which means we go from around 35

million today over 50 million in 2030. This 1.4 percent is slightly less than I think around the 1.9 percent growth that the state experienced in the last 20 years. But, obviously it's significant growth.

We're using the UCLA Anderson study for the household income growth. That actually was through 2020, so in doing the analysis reporting today through 2030 we have to -- we're basically extrapolating those numbers for another ten years.

On the long-term gasoline price, that's the number in constant dollars. That's based upon assuming the long term over this 30-year period of $22.50 for the world price of crude oil. And the diesel prices would be just slightly more than that.

We're assuming basically no fuel economy growth by classes. This is consistent with the present trends. And also the fleet average fuel economy tends to stay very constant. We're assuming through 2010 there will continue to be some growth in sport utility vehicle penetration, but at the same time we're continuing to get rid of the vehicles from the '70s and '60s and so forth that were of lower fuel economy. So the

fleet fuel economy for light duty vehicles in the state, we think, will be staying relatively constant.

And on the penetration of electric vehicles and hybrids, we're using some numbers we obtained from the staff earlier of the Air Resources Board, and we're basically assuming growth in EVs from about 4000 to 30,000 over the timeframe. And from the alternative or the advanced technology partial ZEVs which we're using for the hybrids of going from up through about 158,000 at the end of the forecast period per year.

The primary model we're using to develop our gasoline demand, and the model that we also use for our analysis of the light duty vehicle strategies is our CalCars forecasting model. This is a model based upon household choice of number of vehicles and types of vehicles.

It considers the income and the number of workers and the number of people in the household. And it selects vehicles based upon the attributes of the vehicles. And we primarily used the EEA firm with K.G.Duleep as a consultant to provide us these attributes for these vehicles

over time.

So the operating cost reflects the price of the fuel divided by the fuel economy. And then there's also the price of the vehicle which in certain cases would reflect increases in price as appropriate. And then range and acceleration and those types of variables.

And then the forecast of the model is then calibrated to the vehicle registration database that we get from the Department of Motor Vehicles. And so we're able to calibrate to the number of compact vehicles, the number of compact SUVs and that type of level of precision.

So we basically have outputs then for both the light duty and the trucks. And in both cases, using the CalCars model we get the number and types of vehicles owned by the classes, such as compact, large and so forth. And then the annual vehicle miles traveled. And then knowing the fuel economy of the vehicles, why then we identify the fuel consumption by class for cars and light trucks. And that's done on an annual basis over the forecast period.

We used the freight energy demand model that we have here at the Commission to provide

similar outputs for the trucks larger than 10,000 pounds gross vehicle weight. And once again we get the number of vehicles by class and then the travel.

This model basically takes the economic growth in different sectors, and then we forecast the types and number of trucks growth based on those economic growth.

And then finally once again we have fuel economy numbers, and so we're able to determine the, in this case the gasoline consumption, which is somewhat less than a billion gallons at this time for these types of trucks. And then approximately about 2.6 billion gallons for the diesel fuel use.

This is a brief summary of the kind of perhaps the key findings from the forecast. One that Mike was highlighting and has a lot of impact on our thinking of now and in the future is this continued growth of gasoline demand of about 1.6 percent; and somewhat higher demand for diesel demand on an annual basis.

Due to the forecast for a relatively prosperous California in the future, the vehicle miles traveled will be somewhat higher than the

population growth, which was 1.4 and the forecast is, I think, 1.8 percent growth in the VMT, on the average.

And then, of course, will all of this growth in VMT and so forth, then we are faced with a societal cost which is perhaps the reason that we're here today, is the accidents, infrastructure, traffic congestion and greenhouse gases as examples.

And finally, the alternative fuels of electric and natural gas will be about, in our basecase, using the assumptions that I noted earlier and also looking at particular, especially the demand for electricity and natural gas in the transit sector, both for the electric rail and the natural gas buses, we've forecasted those fuel types will account for about 1 percent of the transportation energy demand.

And this is the graphs pretty similar to what Mike showed before. And you can see where it's, you know, the diesel demand is growing somewhat faster, I believe, than the historical. And the gasoline is, you know, is relatively similar, slightly lower.

And as he noted, you know, what we're

saying with this forecast over the next 30 years, the gasoline demand will more than double from what it was over the 50-year period from 1980 to 2030; and the diesel demand appears to be about five times higher over that time period.

This is another summary of the results showing indeed how the miles traveled will increase as we mentioned. Similarly with the population growth and economic growth, we're forecasting a similar growth in the number of vehicles. And then the growth in hybrids reflects the anticipated growth related to the advanced technology of PZEVs and the ZEV mandate. And then this reflects the electricity and natural gas demand, reflects some contribution from light duty vehicles, but predominately affected by our forecast of transit demand for these fuels.

And that's it. Okay, anybody have any questions?

DR. LONG: Yes, I'm Russell Long, Bluewater Network. I had a couple of questions. One was really a clarification on how your deriving some of your fuel consumption data.

For example, we're familiar with the numbers that the Department of Transportation puts

out of 27.5 miles a gallon for an average passenger vehicle or passenger car, but less well known is the fact that EPA just revised some of its numbers to reflect that the actual onroad, despite the values that DOT gives us, is closer to, it's 20 percent lower, actually, closer to 22.4 miles per gallon.

And unfortunately we have some misleading testing that's being done by DOT in terms of how they do these analyses and EPA and the combined tests. Doesn't show a lot of things, for example. Increased vehicle speeds, after we increased the highway speeds the tests did not actually show any adjustments on that. The tests were done static without any wind resistance. Two wheels are measured rather than four. So there's a lot of problems with that.

So I was curious what factors had been used there to determine these numbers.

MR. STAMETS: What we use is a 16 percent adjustment. So if 20 percent was a better number well then we're not adjusting quite enough. What we're using is a 16 percent adjustment.

DR. LONG: We'd urge you then to consider revising those slightly downwards. EPA,

at our request, just did revise those this year, the recent numbers they came out with about two months ago.

And I think they will continue to revise them downward into the next year because we're seeing some particularly large discrepancies with SUVs, where in fact the window stickers, themselves, showed 12 miles per gallon in one mode and 16 in another. And the drivers are reporting 12 and 12. So that's an illustration of a pretty big change from what we're seeing on the stickers.

MR. STAMETS: I might just comment that our forecast is calibrated to the total fuel demand in the state based upon Board of Equalization numbers. So, in one sense if what we do is we, you know, change the fuel economy, then we proportionately have to change the VMT so the two match.

So an adjustment in the fuel economy measure may not have much effect on the forecast in the future because we're calibrating it to the present numbers. But it's still, you know, particularly comparing different types of vehicles, which we do in this analysis. So that would be where it would be especially important,

if the SUVs had a different factor than the cars, say. That would be important to incorporate that especially, also.

DR. LONG: My second point is that I noticed that you show no change in fuel efficiency into future years as one of the assumptions --

MR. STAMETS: Yes.

DR. LONG: -- in your modeling. And it's worth recalling, though, that over the past 14 years average fuel economy has dropped every single year since 1988, reaching its lowest point since 1980. And the trend lines, since we apparently are using trend lines in all the other models so far, I think would indicate that we should show a decrease in trend line on that unless there's assumptions going in the other direction that you're privy to.

MR. STAMETS: Well, I guess I would point out that the average fuel economy for cars has not gone down from --

DR. LONG: Right.

MR. STAMETS: -- year to year, nor has it for light trucks. It's primarily the fact that the light trucks are lower than the cars, and that the percent sales of light trucks including the

SUVs is increasing.

DR. LONG: Right.

MR. STAMETS: So we are accounting for that. I think on the slide I said by class, and that's, in other words, we're assuming compact cars still have the same fuel economy. But we're not assuming that, you know, the average new fleet being sold in California would have the same fuel economy each year.

However, I did note that even when we make the assumption of increased SUV sales, when we look at what's happening to the fleet average of all the cars and light trucks in the state, it turns out as we're continuing to get rid of the older vehicles, the fuel economy for the fleet stays relatively constant throughout the period.

DR. LONG: And it sounds then as though you're considering that SUV sales will continue to increase --

MR. STAMETS: That's -- yeah, --

DR. LONG: -- on the trend line we've already seen?

MR. STAMETS: -- through 2010 we sort of assumed it would kind of, I guess, saturate at that time.

DR. LONG: Okay, my last question was just on hybrids. I'm wondering what assumptions you have about fuel mileage for that class of vehicles.

MR. STAMETS: For what we call the full hybrids, like the Prius and Insight that we use in this analysis, we basically use as a nominal number 50 percent more fuel economy than their counterpart of conventional gasoline vehicle.

DR. LONG: So, in other words, with hybrid SUVs that we might be seeing soon, you would imagine that -- your assumptions are that they would get a significant jump from where they are today --

MR. STAMETS: Well, yeah, --

DR. LONG: -- 50 percent more or less?

MR. STAMETS: -- if they're, you know, truly what we call a full hybrid, and not more of a 42 volt, you know, integrated starter system, but are more comparable to the other types of vehicles I mentioned, then that's the number we're using, yeah.

DR. LONG: Well, we hope you're right with that one. Thank you.

MR. SMITH: Hi, thank you for your

presentation. I'm Dave Smith from bp. Just a couple of questions.

As you're looking at the California petroleum demand and production capabilities, have you looked at more like a pad level, west coast? Most of the refiners, you know, as they look at supply and demand and meetings its markets, have refineries not only in California, but in the Northwest. And so quite often there's an integration there.

Have you looked at that approach to, you know, I know you're focusing on California, but there could be some things going on, especially in the Northwest possibly, that might impact what goes, you know, the availability of fuels or whatever in California. Have you looked at that at all?

MR. STAMETS: Well, first off, you know, I'm primarily representing the demand side. But as far as it affects our demand forecast we are allowing for a certain amount of imports that basically a way of, in this basecase, as far as allowing us to meet the demand and basically it's incorporated in our price forecast.

So we don't necessarily specify where

that additional demand will come from. But we're certainly not foreclosing that it could come -- we're assuming it will come from outside California, a portion of the refined products.

MR. SMITH: Okay. I'm not real familiar with northern California operations, but I know in certain parts of the country heating oil demand is decreasing as it's being replaced with natural gas or other materials.

Did -- heating oil is lumped in with diesel, is that where whatever heating oil is used in California? Probably not a large amount.

MR. STAMETS: Basically the numbers that I have provided have all been transportation numbers. So they wouldn't include specifically the heating oil. Although the heating oil is, you know, is not a significant factor in California's assumptions.

MR. SMITH: And I'm just kind of talking off the top of my head here, but that's one of the reasons why I talked about the Northwest. You know, we've seen heating oil demand go down. And as heating demand goes down in the Northwest or other areas, that allows that material to potentially be upgraded to other products and

becomes available for import or whatever, --

MR. STAMETS: Um-hum, um-hum, --

MR. SMITH: -- so that's kind of the genesis of that --

MR. STAMETS: Okay.

MR. SMITH: -- that original question. This isn't probably very important, but I know that in other debates the issue of nonregistered vehicles has been an important aspect. Does that factor into your demand cases, or how do you deal with that? You probably just look at what we're using today?

MR. STAMETS: Well, yeah. I mean the key thing as far as the amount of energy use is the fact that we calibrate our work to the actual energy use. And we do in our analysis of the DMV data, track it pretty carefully. And actually not only include just the vehicles that are currently registered, but I think it's some two or three million vehicles that are either they're late on their registration or they may be -- the registration may have been forgotten or whatever.

So we do include those vehicles. And so their impact on the fleet is included.

MR. SMITH: Okay. The last question is

with regard to your freight model, I was just interested in how does that deal with out-of-state fueling future projections on that, for freight, trucks moving around the state? Does it keep -- is there a costing assumption about how much heavy duty vehicles are fueled out of state that operate in the state? Or does that change, or what?

MR. STAMETS: What we do is we use estimates, once again that we get from the Board of Equalization, on the amount of diesel that's consumed in the state, based upon their fuel tax information.

And actually then the main trucks we focus on are the trucks registered in the state. So we basically are using the trucks registered in the state that consume the actual amount of fuel consumed in the state.

So there may be some discrepancies there, but we are, in fact, I think at least accounting for all the fuel that's consumed in the state.

MR. SMITH: The reason I bring that up I know that truckers have contested that because of car diesel standards that there's been a considerable shift of fueling from instate to out

of state because of the price differential that we customarily see.

And depending on what you assume about car diesel standards versus federal standards you may or may not see that price differential.

MR. STAMETS: Okay.

MR. SMITH: And so I never really thought too much about it before, but you're going out to 2030 you may not see that price differential, and you might see that out-of-state fueling go back down. But, anyway, just a thought.

MR. STAMETS: Okay, thank you.

MR. SMITH: Thank you.

MR. CARMICHAEL: Good morning, Tim Carmichael with the Coalition for Clean Air. Just a couple of questions.

On your last slide I would have to say I was quite shocked at the low number of hybrids that you're showing in penetration for 20 years or 30 years from now. How did you arrive at a number so small?

MR. STAMETS: In our basecase this is the number based on what we understand to be the, I guess essentially the likely response by the

manufacturers to meet the ZEV mandate. And as I mentioned, like for example that was presuming that the number of AT PZEVs, which we were assuming would be hybrids, would be, I believe it was 158,000 sales in like 2020.

So those are the numbers we used as a basis for generating. So it's -- we, in some of our other strategy analysis, like in looking at potential higher fuel economy levels and so forth, were considering other examples in the course of this broader analysis. But for this case, for the basecase we used the basically consistent with the mandate.

MR. CARMICHAEL: Thank you. The second question, the first row in that same chart or table, vehicle miles traveled, this may be a little unusual way to look at it, but I'm wondering if you've done a reality check and considered whether it's physically possible for VMT to, you know, to rise 60 percent.

If, you know, our Governor is correct and we're not going to see any significant new freeways, is it physically possible for VMT to be that high?

MR. STAMETS: I don't suppose, you know,

I can't say we specifically have done a reality check. I suspect, you know, it obviously would require the VMT use to be substantially distributed. In other words you'd see a lot more in the Central Valley; you'd see a lot more, you know, 20 or 30 miles from here and so forth.

So I suppose it's physically possible, but we haven't actually, you know, analyzed the impacts --

MR. CARMICHAEL: My suggestion specifically would be that you check with Caltrans and/or some of the COGs and just see that they've already done considerable, you know, quite a bit of work --

MR. STAMETS: Yeah, I'm aware --

MR. CARMICHAEL: -- in this vein --

MR. STAMETS: -- of the, you know, of some of the -- yeah, there's studies --

MR. CARMICHAEL: And SCAG in southern California I know is starting to recognize that there are limits on --

MR. STAMETS: Right.

MR. CARMICHAEL: -- you know, how many roads -- how many cars we can put on the roads. Thank you.

MR. STAMETS: Thank you.

MR. MAZANEC: Good morning, Frank Mazanec, Onsite Energy, representing Waste Management Corporation.

I was somewhat surprised at the increase in diesel consumption over time relative to gasoline. And I was wondering if I'm not mistaken CARB last year classified diesel as a carcinogen, and as a byproduct of that, actually directed fleets to -- mandated certain changes in trucks, whether they be waste trucks or school trucks, et cetera.

Waste management, itself, is converting a portion of its fleet, about 200 vehicles down in San Diego from diesel to LNG. And quite frankly, plan to do more so.

Has that been taken into consideration? Specifically the CARB classification and the impact on diesel use?

MR. STAMETS: Probably there's someone in CARB who can address that better than we. What we have done is we have allowed for some specific uses of LNG and natural gas, as you've talked about.

However, our forecast does assume in

general the, you know, the typical heavy duty truck running around the state will continue to use a clean carb diesel as fuel.

Anybody else want to make any comments on that?

DR. McCANN: Richard McCann with M.Cubed representing Diesel Technology Forum. Good to see you again, Leigh.

MR. STAMETS: Yeah.

DR. McCANN: Several questions. One, have you conducted any kind of backcast on your historical demand forecast using this modeling approach? Have you looked at how your, if you had run the parameters for the last 20 or 15 years through your model, what sort of demand forecast you would have come up with?

MR. STAMETS: One thing is for the type of model the CalCars model is and the lack of, in general, DMV data and so forth, that it's almost impossible to do that in any really meaningful way.

There certainly is, in general, very sensitive on what's assumed for fuel prices and what you assume for fuel economy, you know, and so I guess in a sense the answer is no. But on the

other hand, if we used, you know, the appropriate VMT and the appropriate fuel economy, well then we would have basically had been, you know, essentially the right fuel demand, too.

But, --

DR. McCANN: Well, I guess there's a question of that you might take the existing vehicle registration, ignoring the CalCars' component of the model --

MR. STAMETS: Um-hum.

DR. McCANN: -- but looking at the existing vehicle registration parameters, running it through your model with looking at the impact on VMT, you might actually have to look -- might want to look at the turnover rate in vehicles, that sort of thing, in terms of looking back.

I don't know enough, in fact I have some other questions about model parameters that --

MR. STAMETS: One of the questions I think would come up, what you're going to be assuming for VMT, because, you know, particularly in the '80s there was a tremendous growth in VMT, and I can't claim that we were, you know, accurately forecasting that it was going to be over 4 percent and that type of thing.

DR. McCANN: Um-hum. In looking at the CalCars model itself, the first question is do you have any documentation in the model that shows the parameters, et cetera, that were used in the model?

MR. STAMETS: Yes, we've had several pieces of documentation in the past, and I'm trying to think how much description is in this report.

DR. McCANN: There's virtually none.

MR. STAMETS: But not as much as you'd like. So we do have other documentation we can make available to you. In fact, there is at least one report on the Commission's website now.

DR. McCANN: Okay, so --

MR. STAMETS: Maybe we can help you find it, but it's there.

DR. McCANN: Okay, and so the parameters that are in that documentation have been essentially unchanged for this forecasting?

MR. STAMETS: Right.

DR. McCANN: Okay. And then a question about the CalCars model. From what I've seen of the inputs it's not apparent that it includes adjustments for durability, expected durability

differences between motor vehicles and also other maintenance costs which basically convert to a cost per mile maintenance cost for a vehicle.

And both of those factors go into vehicle choice decisions. I mean people buy a Mercedes because they last. Some of them last a million miles. That doesn't seem to be entered into the CalCars model.

And actually one thing that surprised me that was in the model is top speed of the vehicle, as though that's a relevant factor in vehicle choice. I don't know if you're making adjustments to this model at this point, but that's --

MR. STAMETS: Well, we have in the past, looked at particularly like luxury and higher priced classes and so forth, which maybe they would -- I would assume they'd be somewhat tied to the reliability issue, or the long-term issue.

And we weren't able to identify that it significantly affected our modeling. So we're no longer doing that.

As far as the top speed, it is primarily in there to give us the flexibility to look at alternative fuel vehicles where in some cases there might be some issue about the speed.

Although I don't know whether that's necessarily true now, either. But that's the reason it's there.

DR. McCANN: Right, I would assume that would be picked up in acceleration rather than in top speed, but that's -- it seemed like the two factors were duplicative.

MR. STAMETS: Okay.

DR. McCANN: But I was surprised to not see the durability given --

MR. STAMETS: Okay.

DR. McCANN: -- given that that factor is highlighted quite a bit in the car-buying magazines about the durability and reliability of expected vehicles.

MR. STAMETS: Okay.

DR. McCANN: And having recently purchased a car, and that being one of my primary factors, was --

(Laughter.)

MR. STAMETS: Did you make a good choice?

(Laughter.)

DR. McCANN: Too new to tell.

MR. STAMETS: What was the fuel?

DR. McCANN: The same as everybody else's fuel, gasoline.

(Laughter.)

DR. McCANN: Turning to your freight model, the freight model output, question about truck turnover. Does this model incorporate differences in costs between different types of fuels for different types of trucks in your forecast of number of vehicles owned by class or types of vehicles?

MR. STAMETS: You mean the cost of the truck, itself?

DR. McCANN: Right. Well, having just a little bit of background, about a year and a half ago we did a study looking at comparison between diesel and LNG fuel costs. And the cost of LNG fueled heavy duty trucks, class A trucks, is much, substantially higher than for a diesel truck.

MR. STAMETS: Okay.

DR. McCANN: So that would actually convert into greatly affecting the turnover rate in trucks, in the truck fleet. And I was just wondering if you had incorporated that in your freight model truck.

MR. STAMETS: No, we don't have that

type of detail. First off, within the freight model we are not directly looking at LNG vehicles; it's just limited to gasoline and diesel. We make sort of an outside adjustment for LNG use of trucks.

And then as far as sort of competition between the fuels we simply have kind of a long-term algorithm that we can adjust for that trend. But it's simply an exogenous adjustment.

DR. McCANN: Right. I think that one of the things that you would find in competition between LNG and diesel-fueled trucks is that as you slow down your purchase of new trucks that you would have the fuel economy would not increase as rapidly in diesel trucks.

MR. STAMETS: Okay, well, if you slowed it down --

DR. McCANN: For that aspect of the fleet.

MR. STAMETS: That makes, that sounds reasonable.

DR. McCANN: In terms of your demand forecast, do you have the parameters for the income and price elasticities in your model?

MR. STAMETS: Well, if you're familiar

with CalCars, it's essentially built in in the sense as how the consumers respond to price changes, how they view the utility of the vehicles. So there's not an elasticity, you know, directly, but you can basically impute it from how the model responds to price changes and economic changes.

DR. McCANN: Right, but I would expect that, I mean as you saw the VMT chart, that the VMT rose into the -- or there's basically a bump in the VMT that rose rapidly into the '80s, dropped again into the '90s.

MR. STAMETS: Um-hum, certainly, yeah.

DR. McCANN: Rose again into the future. And that change in VMT is a combination of price and income factors.

MR. STAMETS: Right.

DR. McCANN: And that affected actually existing vehicles. The CalCars model seems to focus on new vehicles, purchases, and then basically makes an assumption about how vehicles are driven on a constant basis after they're already purchased. Or is there a parameter in the CalCars that changes the utilization of existing vehicles already on the road?

MR. STAMETS: Well, yes, I mean, first off, I may have not been sufficiently clear. The model looks at the household holdings or choice for both new and used vehicles. And then it also, based upon the vintage and the attributes of the vehicles the household holds, whether they're new or old, then predicts what the VMT would be based upon the income, the number of workers in the household, the cost of travel.

And so that, you know, in theory that those adjustments will be made.

DR. McCANN: So if you change the fuel price and you change the income in the household then the VMT of the existing vehicles would change in the model?

MR. STAMETS: Yes.

DR. McCANN: Okay. And then last question was about societal costs of transportation demand. Do you have a model developed for that yet, or is that actually someone else's topic of discussion?

MR. STAMETS: Well, I think that for the most part will be what Mike was referring to as what we'd be working on in the task one portion of the study.

DR. McCANN: And then actually there was one other question I had was do you have -- one of things that would be useful to see is the VMT per capita for automobile usage. It gets back to the question of capacity of the roads, a different way of looking at this is --

MR. STAMETS: Okay.

DR. McCANN: -- how much can an individual actually drive in a year. If you're getting up to 30,000 miles a year for an individual, it seems a little --

MR. STAMETS: Yeah, well we're having the --

DR. McCANN: -- per individual.

MR. STAMETS: Actually I can't remember exactly what that number is. I think we did look at it. We're forecasting VMT to grow only slightly more than the population, so in that sense the growth per driver won't be a very significant change.

DR. McCANN: Okay. That's it, thank you.

CHAIRMAN LLOYD: I had a question, two questions, actually. Given one of the roles of the document is -- with the policymakers, and

you've got a model, you know, you can ask what if there.

When you're looking at the heavy duty side have you looked at the scenario where basically you assume a significant portion of the trucks have auxiliary power units, and when they're idling they can save fuel that way?

MR. STAMETS: No, we haven't. The model, as it presently exists, is we basically assume a certain fuel economy base, and that applies to the VMT. Now, so we would just simply have to make an additional analysis really to; the model, itself, is not, I mean we certainly could do something, but the model, itself, is not really set up to do that.

CHAIRMAN LLOYD: The other one is following up on Tim's question, but turning that around. What level of penetration of hybrids would you have to see to have a significant impact on reducing petroleum dependence? I presume you probably haven't done that, but I presume you could do that?

Okay, you've done it.

MR. STAMETS: Well, that will be discussed --

CHAIRMAN KEESE: This is basecase; that's one of the alternatives.

MR. STAMETS: That will be discussed more when we look at the fuel economy, higher fuel economy levels. We'll discuss some of that this afternoon.

CHAIRMAN LLOYD: Since I won't be here this afternoon can you give me a teaser?

(Laughter.)

MR. STAMETS: Well, let's see if --

CHAIRMAN LLOYD: Do you have a number? What a range?

MR. STAMETS: I'm trying to think. If we get -- is Chris Kavalec here? Is it something like 10 or 15 percent where we start getting basically constant growth in gasoline demand, and then more than that we actually start the demand going down?

MR. KAVALEC: I'm sorry, I missed the beginning of your question.

MR. STAMETS: Would you come up to the mike now that I've called you. So the question is, Chris, what level of hybrids does it take to make a significant effect on gasoline demand.

MR. KAVALEC: Well, I guess it depends

on what's significant, how significant is defined.

(Laughter.)

MR. STAMETS: Okay, well, there's the man that asked the question.

CHAIRMAN LLOYD: Okay, well, go with the extreme. Would it be possible to show a penetration of hybrids in 2030 so you'd have no significant impact, I would say within experimental error, impact compared to 2000?

MR. KAVALEC: I haven't done that specifically, but my guess would be no, that you can't, with hybrids.

You're asking can you have enough hybrid penetration so that you have no growth --

CHAIRMAN LLOYD: I was just taking the extreme, but let's put it another way. Is there a level of hybrid penetration that would reduce demand say 30 percent?

MR. KAVALEC: Thirty percent, yes.

CHAIRMAN LLOYD: Okay.

MR. KAVALEC: Yes.

CHAIRMAN LLOYD: And come up with a reasonable number? What I'm saying, a feasible penetration.

MR. STAMETS: Well, let me just -- I was

just thinking one thing is certainly like conventional technologies, we're talking about somewhere say in the -- you get 40 percent improvement in fuel economy. And then we're talking about the full CAFE would be another 50 percent.

So to my way of thinking that would be a, you know, we're talking about potentially 60 percent improvement in fuel economy. So there may be some classes in some situations where hybrids are not going to work, but to the extent you could implement them, then you're talking about potentially a 60 percent improvement in fuel economy with sort of using conventional technologies and conventional hybrids.

MR. KAVALEC: And as far as being feasible, I guess many would say that you're not going to have full hybrids offered in some of the larger classes like the large SUV classes ever.

CHAIRMAN LLOYD: But again, one of the luxuries of planning ahead is that you can blue-sky and you can look forward to 2030, and maybe you could actually impact what might be available.

MR. STAMETS: Thank you.

CHAIRMAN LLOYD: Thank you very much.

MR. KOEHLER: Hi. Neil Koehler with Kinergy Resources. I have a question in terms of the basecase on how the use of ethanol in gasoline has been treated.

In the year 2000 there was virtually no ethanol blended into California gasoline. Starting next year, dependent upon certain political and regulatory and legislative outcomes it can be anywhere between zero and 10 percent in the basecase and going forward.

And I don't see anything in the gasoline number or in the chart below that would indicate what the assumption is in terms of ethanol use in gasoline.

And obviously for every gallon of ethanol we use in gasoline we're displacing petroleum. So I'm just curious how that's being assumed. And can we tease that out in this basecase analysis so that we see that as a stated assumption?

MR. STAMETS: Well, in our forecast we're basically looking at the, you know, the price of fuel and the energy content of the fuel. And in one sense we don't, you know, look at the demand fuel, that's sufficient information.

As a kind of a background for looking at the basecase forecast I think we're assuming that the federal regulations would be such that there would be about 6 percent of the composition of the gasoline would be ethanol.

But that doesn't have much affect on our forecast, as such, except the pricing includes some effect and the energy content includes a minor effect of that, too.

MR. KOEHLER: But I don't know the legislation, what year was the baseline, but if we're assuming 6 percent ethanol blended into gasoline, then that's 6 percent displacement of petroleum over some basecase.

CHAIRMAN KEESE: Well, what else are you going to add to displace the 11 percent of the MTBE that's in there?

MR. KOEHLER: Well, I mean MTBE is largely a petroleum product, other than the methanol that feeds it, but certainly the isobutylene, so the question would be you can theoretically blend up to 10 percent to meet, and still have a legal fuel.

So there's an opportunity and an issue. It is possible in the future there will be very

little ethanol used in gasoline, you know, if certain political and regulatory events occur like the State of California has asked.

And then there's the potential to blend up to 10 percent ethanol. So it's just, you know, in terms of petroleum displacement in gasoline in the future, assuming no MTBE, because when MTBE is gone it either gets replaced with hydrocarbons or ethanol. One is a petroleum product, one is a non petroleum product.

So I'm just -- it's obviously a relevant issue in terms of both the basecase and in terms of future scenarios assuming zero or 10 percent ethanol with the balance being made up by the hydrocarbons.

So, in terms of petroleum displacement it obviously is a very real factor. And I just don't see it. My first question was, which has been answered, is that it's assuming that it's 6 percent.

And that then begs the question, well, you know, how do we look at how that could be zero or 10 or something, you know, greater than that, even in the gasoline blend.

MR. STAMETS: Yeah, well, you know, the

demand will essentially persist, but the composition of the fuel could vary to meet that demand.

MR. KOEHLER: Right, but I just want to make sure that we're not just lumping ethanol in as a hydrocarbon, because obviously it's not a petroleum product. And if ethanol is in there, then that's nonpetroleum product in the gasoline. If ethanol is not in there, it's petroleum product that will replace the ethanol and the MTBE.

So, you know, maybe that's some future refinement, because it clearly is a very important issue as it affects petroleum displacement.

MR. STAMETS: Okay.

MR. LARSON: Good morning, I'm Jim Larson with PG&E's Clean Air Transportation Program.

In looking at the basecase results for your natural gas demand the 2000 figure's at 46 million therms; 2020 figure is at 150 million therms. I have concerns that these assumptions may be underestimating the contribution that natural gas can make to displacing petroleum.

Did I understand that you were only using through-put estimates for the transit

marketplace --

MR. STAMETS: Now, what I said was --

MR. LARSON: -- to generate these numbers?

MR. STAMETS: -- that was the primary contributor, particularly in the -- yeah, of the demand. If I recall, I think about something like three-fourths or something was related to -- in the natural gas case was related to natural gas buses; and the other was light duty vehicles.

MR. LARSON: The three-fourths is consistent with our program's experience in northern California. Of course, northern California has nowhere near the natural gas through-put that southern California does.

As a follow on to the gentleman's comments from Waste Management, other market niches that are growing their demand for natural gas would include school buses, waste hauling. And as liquid natural gas becomes more available, class 7 and 8 trucks, short-haul vehicles, package delivery and so forth.

So I would suggest that the utilities can provide maybe additional information to I guess help improve the contribution that natural

gas is making today and can make in the future to this effort.

MR. STAMETS: Well, we would certainly encourage that additional information. And then I also might note that in our strategies that we will be discussing this afternoon and that we will be continuing to work on, one of the strategies is how to, you know, increase fuel displacement; increase petroleum displacement by additional use of natural gas and other fuels.

MR. LARSON: Okay, so these are basecase numbers and we're looking for --

MR. STAMETS: The basecase numbers I gave you now, but we'd still appreciate more information because, you know, with regard to that also, yeah.

MR. LARSON: Great. Thank you.

MR. STAMETS: All right, thank you.

(Pause.)

MS. BROWN: While we're adjusting the volume I just want to again request any of the public commenters if you could provide a business card to the court reporter. And please identify both your name and your affiliation for the record before making any comments.

MR. WUEBBEN: All right, I'll try this with the new volume. Okay.

Thank you very much. When I was asked to make a presentation on the scenarios through the year 2050, it was somewhat humbling to think that in the year 2050 I'll be a spry 99 years old, which then suggests to me that perhaps we should all meet in this room in 2050 and review the kind of scope and precision of our work here.

But let me carry on. The intent of my presentation is to suggest approaches that we might take to structuring a credible scenario for addressing the California petroleum dependency in the year 2050. So it's fundamentally trying to answer the question what should inform us about us, or how should we be informed as we think about our 2050 transportation energy policy.

The issues that I'm going to discuss in this presentation are what are the kind of over-riding issues which we would have to think about in that timeframe. What concerns might there be about supply of oil and what kinds of demographic trends will we face during this period.

I'd also intend to look at the three studies recently that have looked at this longer

term question. And then offer some follow on suggestions.

So, what are the central issues which are likely to affect our transportation energy -- so, I'm trying to address here is what are the central issues which are likely to affect our transportation energy use and outlook.

I think central in this, of course, will be questions of supply depletion both globally and perhaps as it would affect the California pool. Certainly demographics, the population growth and the distribution of that demand, is extremely important.

Technology breakthroughs are obviously going to continue such as hybrids, fuel cells, battery electrics and a lot of other technologies.

Geopolitical instability is an unfortunate fact of life, but we would be remiss to ignore it. UFs and California energy security and diversity I think will become of increasing issue. And also, of course, climate variability and climate warming.

What perspective do others have on this future oil kind of scenario? The IEA has observed that peak oil production could occur as early as

2015. The World Business Council recently observed that the consumption of petroleum fuels indefinitely at the expected levels of demand is unsustainable.

Shell, in its recent report, observed that the advantages of new technology such as fuel cells could push the transition to hydrogen well before oil becomes scarce. And the Institute for Energy Politics and the Economy at the University of Grenoble has observed that when the Middle East production of oil reaches or exceeds 50 percent of the world conventional supply the vulnerability of the world oil system to disruption or scarcity will be considerable.

Now, one of the central trends that we have started to see in California really for the first time is the rapid increase since 1996 in the percent of total California crude coming from foreign sources.

In just four years the percent from foreign sources has essentially doubled up to 22 percent. The second largest source of foreign crude to California is Saudi Arabia. And the single largest source of crude is two times Saudi Arabia, and in fact, is Iraq.

Another issue, of course, here is what is the trend in U.S. oil production. And, of course, since its high point in the early 1980s we have observed a continuing decline in the U.S. crude production.

Of course, while California is the fifth largest economy in the world, it's certainly prudent to look at some global population and demographic trends. As the director of the UN population division has observed, that in 1950 there was only one megacity, and that's defined as larger than 10 million people. And today there are 19, and it's obviously going to increase.

He's also pointed out that six countries, India, China, Pakistan, Nigeria, Bangladesh and Indonesia, represent over half of the world's annual production or population increase of 77 million.

And in a recent editorial by Exxon Mobil they pointed out that that region, by the year 2020, will import twice as much oil as the United States.

So, another key factor that can affect our transportation and energy outlook will certainly be the effect that per capita income

growth has on auto ownership. And this, I think, if we look over a 26-year period, say from 1970 through 1996, you see for essentially all the countries that we have data on, that there is a very strong positive correlation between GDP per capita and vehicle growth per capita.

So you'll see both for China, India, Thailand, Brazil, Korea, Japan and the U.S. are all on this upward slope. And you might note, as well, that this point in China's recent experience is where the United States was in 1912.

Now, any scenario for the year 2050 would seem that we should address issues of climate change and volatility. One, I think, important observation was made by Sir John Brown in the year 2000. Quote: To me, the process of reducing the risks of climate change is comparable to the process of disarmament. There is a constant need to maintain momentum."

Another perspective on future climate change perhaps is very strongly shown in the recent data from the World Meteorological Organization, which the status shows that over a 140-year period that 2001 was actually the second highest on a global average temperature basis.

That nine of the ten highest values were achieved over the last decade.

There's also been other studies, like the United Nations Environmental Program is associated over $300 million with this type of potential problem. And I think that there are some, just one or two anecdotes which, in my mind, help inform this perhaps on a visceral way that even this data doesn't.

If you look at the fact that in the summer of 2000 the north pole ice pack had completely melted over a several-week period. You probably heard three or four weeks ago that Buffalo experienced over one week seven feet of snow.

What's interesting to me is that in 1997 during the entire winter season they experienced a total accumulation of 1.7 inches of snow. So that kind of variation. So I think we all have perhaps some anecdotes, but that those will be increasingly important as we look forward.

So then that brings us to the question well, how have other organizations looked at this question of long-term energy outlook. There have been three studies that I'm referencing here. One

is by Shell in October of energy needs, choices and possibilities.

There's another that DOE did in May of last year, future U.S. energy use, a 50-year perspective. And then the World Business Council recently performed some work on mobility 2001, world mobility at the end of the 20th century.

In very gross generalization these three studies, I think, help us look at this question. The Shell study looked at various -- two fundamental scenarios. DOE developed six strategies that they were assessing. And the World Business Council performed a general assessment.

When you look at all of these studies I think that there's some meaningful conclusions that you can draw from them. All of the studies have observed that there are implications of growing petroleum demand and demographic trends, and that these have serious potential long-term implications for oil prices.

All of these studies have also noted that the scarcity of oil may occur within the next 50 years certainly. And there has been an observation by Shell, of course, that global

climate change is of central importance. And that this problem transcends the traditional polarity between government and industry.

DOE concluded that the long lead times involved force us to address policy issues at this time. The DOE also noted that a transition away from conventional petroleum will be necessary when the world oil peaks in the next several decades, from their standpoint.

Shell observed that there may be unexpected discontinuities relative to the business environment. Shell also noted that the two major strategies that we would perhaps want to engage to address climate change would be increasing vehicle efficiency, and expanding the use of natural gas.

The DOE concluded that market solutions won't necessarily result in the most optimal or desirable future due essentially to the externalities that we've been talking about.

The World Business Council has also concluded that some other source of transportation energy will be necessary with the transition starting sometime between 20 and 50 years from now. And also their concern about that 65 percent

of the world's petroleum reserves exist in the Middle East.

So with all of that as background, we're trying to distill some implications for a credible oil price scenario for our work here. And so it seemed prudent and justified that we would look at constraining oil supply; and that would be driven fundamentally from a declining resource base, or political instabilities, or some combination. Or due to some environmental sense of imperative which seems certainly to be in the present timeframe.

There are also, I think, conditions of unconventional sources of petroleum will have an important role because there will be an increasingly higher marginal fuel price from those new sources that in effect set some new price floors, if you will.

And there's a range of alternatives that those alternative sources could come from: gas to liquid technology; gas either in the continental U.S. or in North America or offshore; tar sands; alcohols from renewable sources; and biomass; hydrogen from natural gas; or what I'm trying to term here hydrogen from trigeneration markets.

That is where the value of hydrogen is leveraged based on its value both as a direct energy source from natural gas; it also has value as an uninterruptible power source for mobile applications; and also has some cogeneration potential heat capturing CHP type applications.

So, looking at those alternatives, then, suggests that we look at a band of prices that might be operative in the future that could then be fed into some work that Peter Berke is doing for us in this analysis.

And the ranges that we have thought about here: Look at oil price ranges from $22 to $27. Alcohols from 35, this is price per barrel equivalent, if you will. And these are possibilities from our standpoint.

Alcohols could range from 36 to $67; gas to liquids could be around that range, 37 to 70; hydrogen with all the coproduction I mentioned in a fairly tighter band, perhaps in the low 50s to 70. And hydrogen from natural gas straight would be in a much higher band, perhaps from 54 to 96.

What does all this really mean? We're trying to kind of again get some coherence around a scenario and transition. It seems that if you

look at -- I'm sorry, it's very hard to see -- the left-hand side are the annual gallons that are traced. I'll use a pointer here.

The line that's in the center of the graph refers to the annual gallons axis on the left. And on the axis on the right, which is the price per barrel, and each of the three boxes refers to the regime in which those prices might be observed.

And this is trying to kind of blend the various trends of increasing use, what the prices might be if there were an oil production peak with the substitution of nonconventional sources under kind of a conventional set of concerns.

And then what happens if there is a tremendous imperative to replace as quickly as possible those petroleum products, that carbon with noncarbon and low carbon fuels. And you can see that perhaps under that condition that will justify that transition, or that those would be occurring kind of at a similar time.

So, in summary, it seems that when you look at all this information or perspective that there certainly is a good likelihood that the supply of oil will be constrained in the timeframe

of this AB-2076 work. And that there will be continuing upward price pressure. And perhaps even a significant possibility for price volatility and variation.

That there will be other higher priced transportation fuels which can come on in the timeframe that we're talking about here. And that we certainly are trying to get our methodology to address these higher priced scenarios to reflect this changing landscape.

So that's at least my observations at this point in time, and I appreciate any feedback we get. Thanks very much.

Lights.

Yes, questions? Roland.

MR. WONG: Thanks, Paul. You have taken on a truly daunting task in trying to predict 50 years into the future. But, appreciate the effort. And the Natural Resources Defense Council and others in the environmental community also concur with the opinion that we should be looking long term within the context of the study, particularly looking at this issue of oil and petroleum dependency. It's an issue for the State of California; it's an issue for our nation.

For the record, Roland Wong with the Natural Resources Defense Council.

I want to draw attention first of all to the agencies, ARB and Energy Commission, to a new report called, and my apologies to my friends in the oil industry, it's a new report. It's on our website. It's called, Petroleum Addiction.

And it talks about national scenarios. A) it highlights the problem of petroleum dependency. It's an issue of national security; it's an issue of economic security; not just an issue of climate and the environment.

We also lay out five steps for how we can reduce our petroleum, our gasoline consumption for the passenger vehicle sector by 50 percent by 2030 from today's level. A cut from today's level 50 percent through the use of fuel efficiency, hydrogen fuel cells fueled by renewable fuels eventually, and smart growth are the key measures.

One of the things, and I perhaps will get a chance to talk more about that in the afternoon session, but one of the issues that we are focusing on is the issue of oil dependency. It's not an issue just of long-term post 2030. It's an issue which the country faces in the

immediate term; today, here and now.

Obviously, as we know with the global instability, especially in the areas which control most of the oil reserves, there's a real possibility not just that we will see future oil prices in the 2030 timeframe ramp up; but what we're looking at is it's clearly an area where we should be planning and preparing for an era where oil prices are going to be increasingly volatile and unstable.

I guess one of my questions is in terms of this analysis, and we think it's very important that we attempt to at least try to characterize the instability, the potential for instability in global oil prices that could lead to a very different outcome of the analysis in terms of does it make sense for California to go forward with certain policies and measures to reduce petroleum dependency.

As an example, you know, after September 11th some analysts were predicting that there's increased probability, 20 to 30 percent probability, of disruptions in oil supplies over the next several years. And there's -- a removal of something on the order of three or four million

barrels per day. That would be the exporting capacity of say a country like the size of Iraq.

The scenario some analysts are looking at, what if Iraq, what if the United States should choose to go after a certain country, in this case Iraq, for national security reasons. That could take a certain amount of capacity to export oil off the world market. And that could lead to short-term, at least, price volatility that can double the price of oil is has been one analyst's, I mean I can provide the agencies with the citations about that analysis.

But I guess the issue is you know, we feel it's very important and it's very difficult, obviously, to characterize oil price volatility in an analytical fashion, and it depends very much upon perspectives which are not going to be purely objective. There's going to be some subjective in some manner.

But we feel it's very important that we start looking at situations, scenarios that capture not just the average oil prices, but the potential of oil price volatility.

And I think that also goes to the not just oil prices, but we're expecting, of course,

to see increased volatility in our gasoline markets because of restricted refinery capacity not just here in California, but across the nation.

The Department of Energy, Energy Information Agency, has the administration -- excuse me, is predicting over the next two decades that we're going to be importing an increasing share of our refined petroleum products, not just our crude oil.

This creates an additional issue of not just -- and California's on that trend, also. We're looking at a likely scenario of refineries, we don't see from an environmental community perspective, we see very difficult to see how refiners going to come into California. So we're expecting to see increased importing of gasoline from other parts of the country and other nations. And this creates another aspect of vulnerability due to petroleum dependency.

You know, as we know, demand is growing globally for products; in Europe, demand is rising; tightening of gasoline and diesel specifications are also having a situation restricting refinery capacity.

So I think we should also be looking at scenarios of oil and gasoline price volatility driven by a number of different factors.

And maybe the question, I guess, is is there a plan to do that, and how do you propose to handle that situation.

MR. WUEBBEN: Well, I thank you greatly for those comments, Roland, because that really is, I think, at the heart of one of the questions that we are trying to answer.

It's been difficult, I think, to develop a methodology that adequately addresses some of these volatility questions, both in terms of product side and the crude side. But it's certainly a central question for us.

And I think we're just struggling with how to develop an adequate analytical means of tracking these volatility of vulnerabilities, if you will, that are distinct from the average vulnerabilities.

There do appear that we may be in a new regime, if you will, where there's step changes in, you know, in how the market is structured. When things are now so tight, when they hadn't been tight fundamental in terms of refinery over a

generous, substantial excess capacity, you know, all those factors are now somehow coalescing.

And, you know, there may be some light-switch type effects which, you know, are hard to anticipate. But, you're right, that we do need to look at some of these scenarios on a what-if basis in terms of the security vulnerabilities, et cetera.

And that's one of the reasons why at least I wanted to get that information in our cognizance.

But, you know, we'll want to work with you and others in industry to try to perhaps establish a sound basis to make some of those estimates. But it certainly is a crucial part of the policy making process.

CHAIRMAN KEESE: I'd just observe that I don't think that discussion can be isolated and placed in the year 2030 to 2050. I believe this is a discussion that has to take place in the current timeframe, also.

MR. WUEBBEN: Yes, thank you.

MR. MAZANEC: Frank Mazanec with Waste Management Corporation. I hope this comment doesn't seem too exotic, but I remember back in

the early '80s when the gas lines were particularly long, one of the solutions that the government took at the time was the creation of coal liquefaction.

And I would just like to encourage, even if it was rejected, because when you talk about ultimately rejected because it is a technology that is proven. It goes back to the Hitler regime and the Nazi regime, and it's a very expensive process. But when you talk about reducing the dependency and a leadership role that the State of California, for example, could take, obviously the coal isn't in existence here. It could be imported.

But when you look at the array of total solutions, it was actually a joint venture formed, a subsidiary of Waste Management called Wheelabrator Technology, an international coal refining company, was formed with their products and chemical company.

So I didn't see it explicitly, but I would encourage at least the thought to take maximum use of resources in the country and maybe later we'll get an opportunity to discuss a little more about methane.

But one of the great resources this country has is coal. And the possibility of the liquefaction of that coal. And meeting the very subject that we're talking about, and utilizing that technology, I think should at least be thought about and included in the mix. And thought about, and conclusions reached. And that is a comment that I would offer for your consideration.

MR. WUEBBEN: Fair enough. Any other comments? Good, I'll see you here in 2050.

CHAIRMAN KEESE: One more.

MR. WUEBBEN: Oh, excuse me.

MR. FERGUSON: I'm Rich Ferguson with the Center for Energy Efficiency and Renewable Technologies.

Thank you, Chairman Keese, for your comment that this is a problem we need to look at now and in the next few years, not just out there, I won't say how old I'm going to be in 2050.

(Laughter.)

MR. FERGUSON: The one thing I'd caution about in looking at these scenarios is that for example geopolitical instability. I mean, yes, that's a factor, but I think you just have to look

at the straight economics of how the global oil industry is going to look out 10 or 20 years.

If you look at EIA or the IEA projections the world in general is going to need something like, what, 120 million barrels a day in 2020. And our dependence on the Persian Gulf is double our dependence on OPEC, roughly double. And raises a question about what will the economics look like then.

And if you look at what happened in the electricity markets in California, the west coast, and what happened in the natural gas markets, you can see that it reaches a point if a producer can make more money by selling less, they will. I mean it is the economically rational choice. It's not crazy. They're not villains, although a lot of people think they should be villainized. But I mean it's just sheer economics.

And I think we're rapidly approaching that situation where Saudi Arabia, say, is going to be in a position where they can increase revenues by not increasing production at the rate that is going, you know, that is projected to meet demand.

And it's not because they're villains or

evil or anything else; it's because it's an economically rational behavior.

And so I think when you look at these scenarios you shouldn't think about geopolitical instability that somehow there's going to be a revolution in Saudi Arabia and therefore they're going to, you know, not pump as much oil as we'd like them to.

I think you have to figure out, I mean you have to at least consider that that's an economically rational choice for somebody who owns the resource to undertake.

So, when I look at the EIA projections and where crude oil is going to come from to meet this kind of demand that's projected, I mean I don't see how anybody can be sanguine that, you know, the price is going to stay down around $20. It's just not economically rational for the countries that own that resource to continue to give it away.

So, that's my comment on the scenario analysis --

MR. WUEBBEN: Appreciate that. I think we try to address part of that by looking at how the marginal competitive price points of the

alternatives compare. And that those, in effect, start setting some different benchmarks. But I think you're certainly right, we have to look at that as a primary driver.

MR. FERGUSON: -- even look at how the capital flows as you -- that production --

CHAIRMAN LLOYD: Using that philosophy, Rich, what's the chances then the car companies' going to hold down demand to drive profits up and drive their bottomline up.

MR. WUEBBEN: Great. Well, I appreciate that. We'll carry on, I'm sure. Thank you.

MR. JACKSON: Okay, I wanted to end this sort of morning session here by just kind of reviewing a little bit again what we're sort of faced with relative to what's happening to California in terms of some of the energy flows right now. Some more look at the refining capacity in California.

We'll look at little bit about what is happening to some of the issues that Roland brought up relative to not only the price swings in crudes, but also the price swings in what happens at the product level, the gasoline and diesel levels.

And then provide some summary comments. And, again, what I'm trying to do here is to give you the background perspective of what we're facing and where we need to go. And to keep that in mind when we present to you this afternoon some of these strategies. And I think that will help put things in perspective for you.

Let's look at this chart a little bit. Sort of similar to what you saw before. This time I took it out to 2050. I've showed some projections where are we today.

Population in California is about 34 million. Vehicles, the old saying goes that when you're born in California you get a car and a parking place, so it's about 24 million vehicles. And VMT in billions of miles per year is about 300.

And sort of straight lining it out in 2050 terms you could be up to pretty much doubling our population. A good question is where is that growth going to happen. And I think that goes to what's the infrastructure to move then, it's a fairly large increase in number of vehicles and a fairly large increase in the amount of vehicle miles traveled.

Again, I've shown here combined diesel and gasoline demand, billions of gallons. And going from 2000 to 2015 you can see us going up to about 35 billion gallons needed in the outyears.

World refining capacity, I think I heard a statement at the last workshop is that there's probably enough world refining capacity to last us for five, six years. After that new refineries are going to have to be built in the world. Or the world demand is going to have to decrease.

It's kind of interesting to look right now how the energy flows work into the California refinery. What's shown here is crude sources on the left-hand side, and refined products on the right-hand side. The middle is really our refining system in California.

And you can see right now most of the crude comes from either Alaska -- well, Alaska and domestic California and the rest of the U.S. accounts for 77 percent of the crude coming into California.

As Paul showed you we have a growing amount of this red bar here from foreign sources. Right now we're at about 23 percent, 22 percent. Of that half of it comes from the Middle East.

Then it's fairly well distributed throughout the rest of the world, Central, South America, other, Australia, places like that. So it's fairly well diversified, but it does play pretty big in terms of the Middle East, even today.

And you can see the refined products coming out. Gasoline is predominately the largest. Diesel is really third. Jet A is second to that. Then diesel and then other products are combined in that, Jet A and other.

We are, today, in terms of we're bringing in blend stocks from outside. That would include not only feedstocks, blend stocks, but also MTBE and ethanol are coming in. And we're also right now a net importer of refined products.

At one point in California's history we were a net exporter of that. I don't see that necessarily changing in the future.

What happens then 10 or 15 years hence? Well, you would expect Alaska to go down quite a bit. You would expect domestic to go down quite a bit. And you would expect the foreign to go up quite a bit.

But if you don't increase the California refining capacity then you've got to import a heck

of a lot of product to meet those demands. So you're going to have a heck a lot more gasoline coming in; you're going to have a heck a lot more diesel or jet A or something else coming into the system.

And your reliance then on these potentially Middle East areas becomes even higher.

This chart shows where we are relative to the California refining capacity historically. The unused capacity is shown in the white spot on the top. And you expect that to be relatively narrow, especially these days. There always has to be some unused capacity just for maintenance of the refineries.

But you can see in the past like for example in 1982 we were in a situation where we had excess capacity in California. That means if we had a situation where we had a refinery go down for some reason, it was easily made up by industry. Whereas today where it's a lot tighter, you drop out one or two of the largest refineries and you drop out a lot of product from the market, which then causes large variations.

So we're a lot more vulnerable to, although the industry is a heck of a lot better

probably, also, but we're a lot more vulnerable to any kind of outages that happen to any of these refineries in California.

Talked a little bit about, this shows a plot of world oil consumption, which is this chart here. We can see that the world oil consumption sort of peaked in 1980; decreased as we increased the price; and now is slowly increasing in demand. So our demand for oil continues to increase.

The price shown here, you see the events of the petroquakes in '73, '74 and then '79 causing large spikes in real price. And then we see a period from say 1986 on up to today of relatively calm -- calm relative to this -- price.

So it's relatively been flat. The fact that we have flat price and increase in consumption indicates there's an excess capacity of oil in the world. That is unsustainable in the outyears.

We do see variations that happen. The war that happened in 1991. The reduced demand due to the sort of the Asian flu here in the late part of '90s and instabilities that are happening right now.

You also see on here some of the, we've

shown in a couple places some of the ranges that you would see on a yearly basis on the crude oil prices. So even if it's flat you can see a range that goes from a low of maybe $9 to a high here of like $22. That's a pretty big range.

And the question is how can we model that variation. What effect does that variation have not only on the selection of strategies, but ultimately on the California economy. And we're going to try to model that using the general equilibrium model.

Similar types of variations can be seen here. What's shown is standard deviation, monthly prices. This is for a prior 12-month period. And we're doing it both on crude oil and on ARB RFG. And these are the nominal cents per gallon here.

Crude oil prices are shown here. So you'll see some variation. You see a much larger amplitude on the refined products.

Again, we need to try to, in the general equilibrium model allows us to look at both these types of sectors, not only inputs in terms of crude, but also refined products, and try to model this variation.

Okay, so where are we here? Just some

real brief summary comments. In the outyears we're talking substantial increases in demand if nothing else is done. Probably on the order of 2030 five world scale refineries have to be built someplace just to meet our demand, California's demand. Forget the rest of the world. Ten in the outyears.

Obviously security of supplies is going to be uncertain in these outyears. Middle East sources are going to become more important part of the amount of crude that has to come into California.

We're going to need to import large amounts of gasoline and diesel refined products. And it's clear just to note recent trends that the volatility not only of crude, but also of refined products, is going to be a lot greater.

And the methodology that we're going to explore, not today, but in a future workshop, we'll try to quantify the effect of these kind of variations.

Today we really want to look at strategies now that could help us mitigate that demand. And that's going to be really the whole discussion this afternoon, what strategies can we

come up with that would reduce or displace demand. And that would be more cost effective than business as usual.

So I'm going to end at that, and ask for any questions. If there's none I'll let you go to lunch.

MR. CAMPBELL: Can't let you off that easy. Todd Campbell, Coalition for Clean Air.

I just want to kind of voice a slight concern about what I'm seeing with regard to the studies, the joint study between the CEC and the ARB.

And I think Paul's presentation was an excellent presentation in pointing out some very very keen issues that we need to pay attention to. Some of them were the political issues, the geopolitical instability. Some of them dealt with the global demographic trends and how, you know, increasing populations also increasing GDP and per capita income is going to change the face of, you know, today's world, as well as the daunting task of global climate change.

And the question, it seems to me in the report that we're looking at 2000 as the base year. The question I have is will the report

include strategies which will reduce petroleum demand below current demand of 2000 by 2020 or 2030.

I think this is a very important, you know, alternative that we do need to examine. And it seems to be lacking. So, can you clarify, please?

MR. JACKSON: Yeah, let me try to explain that, Todd. Basically what we're doing is looking at a number of strategies, a whole series of strategies.

And for each strategy we're trying to figure out what the cost is of that strategy; what the environmental benefit or disbenefit is; what the economic impacts are; all those things, okay.

And you can then take various strategies and add them all up to come up with an overall strategy depending on what goals you want to set.

So you might have, for example, let's say you have chosen the goal to be I want the demand to be less than what we're currently using today. Well, there will be a list of strategies that you can pick to do that. But there will also be a cost associated with doing that. An estimate of what we think the costs are.

So then it becomes a question of what is sell-able.

MR. CAMPBELL: Right.

MR. JACKSON: What's do-able.

MR. CAMPBELL: Right. And I also hope that the report in some ways will also look at externalities, the cost of not being as aggressive at the outset --

MR. JACKSON: Again, what we're trying to do is not only look at just, you know, just a simple payback of well, if you save so much gasoline then, you know, you have more money to spend. But if you reduce the amount of gasoline you're using, you reduce the amount of CO2.

We're trying to monetize all those things and it's going to be a cost/benefit analysis that will take that all into account.

Now, people will argue about what the ranges of some of those numbers are going to be, and that's going to be the debate, also, part of the debate.

MR. CAMPBELL: Thank you.

MR. JACKSON: Okay.

MS. BROWN: Okay, thank you very much. Again, I want to thank Chairman Keese and Chairman

Lloyd for joining us this morning.

I would propose -- we're a little ahead of schedule, but I would propose we reconvene at 1:00.

(Whereupon, at 11:50 a.m., the morning session of the workshop was adjourned, to reconvene at 1:00 p.m., this same day.)

--o0o--

AFTERNOON SESSION 1:10 p.m.

MR. FONG: Thank you. My name is Dan Fong; I'm with the California Energy Commission. You heard about some of the larger issues that we're confronting as we develop this report and the analysis that will go along with it.

This afternoon the Staff of the Commission will present some additional detail regarding the key strategies that are part of our current analysis. I will try to describe to you what are the important elements within this analysis and hopefully we'll get feedback from all of the various stakeholders on what we're proposing and/or planning to do to derive these various numerical outputs for these different strategies.

So in the first 30 minutes here I'll be talking about some of the different groupings of strategies that we're choosing to analyze at this point. I'll describe to you the analytical methodologies that we're using to determine the direct benefits that might come from these different strategies.

And then subsequently there will be additional descriptions of those strategies; some

of the assumptions that were made. And then the speakers that follow me will go into greater detail about some of the results of the analysis that we've done to date.

We have four groupings of the strategies that we believe can reduce our future petroleum dependence. These are not listed in any order of importance of preference. They're simply groupings that we felt could more easily describe the various strategies that we're going to analyze.

There's obviously a good set of strategies to improve fuel efficiency. There are strategies that actually displace future transportation petroleum demand. There are strategies that might include some pricing options that could change consumer behavior. And then we lump everything else into the fourth category of other strategies.

In the analysis that we eventually will produce in our report, each strategy will contain these five elements. We'll describe what the strategy is in some detail. We'll provide you some background on the current status of either technology or work that is being done in this

particular area. We'll try to detail the key assumptions that we had to make in order to develop the penetration scenarios for these strategies. There will be some discussion about the methodology that went into describing these options. The results that our work produces.

But we'll also then talk about the drivers for that particular strategy. And some of those drivers have key uncertainties. And so in describing those key uncertainties it gives the reader some idea of either the value of the result that they're looking at, or the degree or weight of potential impact that these strategies might have in the future if they were actually implemented.

Now the purpose of our analysis here really is to measure, evaluate and compare the value of these different strategies using validated and uniform inputs wherever possible.

Again, I want to emphasize that the Commission's analysis at this point is looking at the non environmental direct costs and benefits that come from these strategies. And there are two key approaches in developing the analysis.

One you heard a little bit about this

morning, where strategies allow we will look at the potential impact of those strategies using an analytic modeling capability that is based upon the concept of consumer choice.

But we're also placing a great deal of emphasis on the second approach which is scenarios. We're building plausible futures based upon conditions that we believe can be created that would help implement those strategies, and then to project the results coming from those scenarios.

The key metric that we're using in the analysis is cost/benefit analysis. That probably means a lot of different things to different people. But to the economists it basically says tell me what all the costs are to implement a certain process, and then tell me what the value of the benefits are of that particular action.

And so for each year that that action might be in effect we have costs, that is you have expenditures in a certain year; you also have benefits that come from those expenditures in that same year. And you want to subtract those costs from the benefits to arrive at a net benefit results.

And so each of these strategies involves a lot of information collection, development, particularly on the vehicle technologies and the fuels that might play a role in these strategies. What are the key market barriers. What are the key market opportunities.

We want to identify specific petroleum reductions from the basecase. And that's why we stressed this basecase information this morning. The only way to really compare these strategies is to some baseline.

We're also trying to determine the effect that these strategies might have on vehicle miles traveled. And so there could be a VMT change depending upon how the consumer or how the system then responds to these different strategies.

We want to determine as best we can what are the consumer costs and what are the costs of implementing those strategies.

All those things will be monetized in terms of annual costs and benefits. We'll then determine the net present value of those costs and benefits. And finally, once we get those present values, it's simple enough to then determine what

are the direct net benefits; particularly at this point for the non environmental elements of the analysis.

But at some point the environmental components will then be added in. And so we'll have a complete equation hopefully in February.

Now, I want to spend a little time on describing to you what we mean, though, by net benefits. In sort of the world of economists, they divide up benefits into two major categories. One is direct, and I sort of listed out here what we consider to be direct net benefits.

There are consumer net benefits, which include sort of like the amount of fuel savings that might occur due to a certain strategy. The additional utility that they might get due to some change in vehicle characteristic.

We want to determine the impact on government revenue due to a certain strategy. And then there are these other direct net benefits, which include environmental net benefits. Again, the environmental elements of this entire equation, though, will be dealt with by the results from the ARB analysis.

And so today most of the results that

the staff will be presenting will concern the consumer net benefits and the potential impact on government revenues.

Ultimately, at another stage, we'll also include the indirect net benefits. And we list here some of the elements of those indirect net benefits, primarily the impact on California's economy.

And those deal with things like employment, does the strategy increase or decrease employment. How does that strategy impact the gross state product.

Finally, this will all boil down to a relatively simple formula here of trying to determine the present value of different strategies, or the effects of these different strategies.

We are going to determine the direct net benefits, which is basically just the value of benefits subtracted by the costs of implementing that particular strategy.

We're going to apply two different discount rates; a 5 percent discount rate and a 12 percent discount rate. Now, the 5 percent discount rate really reflects sort of the long-

term investment perspective that government entities or government agencies tend to take when they're considering different investment options.

The 12 percent discount rate really reflects the rate that consumers basically might consider when they're trying to judge the costs of borrowing money or the uncertainty of future savings.

Other economists may say the lower discount rate is sort of like a social discount rate; and the higher rate is like a private discount rate.

We're choosing 2002 as the base year to perform these present value calculations. And if you look at this simple equation it's, I'm sure those of us who have, you know, considered what is the future value of various investments, you'll be familiar with this present value type equation here.

And just to show you the effect of the different discount rates, we're putting up this example here that for instance if you, a consumer, were offered $1000 today that would actually be worth to you $1000. But if you were offered $1000 in say the year 2020, the true value, based upon

these discount rates is much less.

And that's generally how consumers respond to these types of potential investment options. They consider having something in their hand much more valuable than something that might be handed to them in the future. And in that way we get a real tight gauge on the monetary value of that particular benefit.

And so you see these two curves where the upper curve is based upon the lower discount rate of 5 percent. And that's typical of what government organizations tend to view when they make their investment decisions. And that's because they tend to value benefits in the future much more than the private consumer.

And the lower line is really what a private company or a private consumer might use when trying to determine how to invest their money.

So, with that, I'll take any questions about the methodology that we're proposing.

Yes, would you step to the mike and identify yourself.

MR. KELLER: I'm John Keller. Thought this was more informal. I'm John Keller with the

Highway Patrol.

I'm wondering about your discount rates in terms of incorporating risk, future assessments of risk.

MR. FONG: Well, I guess that's a good point to mention at this stage. We're probably going to do some sensitivities, if at all. Although we believe that this range between 5 and 12 percent really does introduce a lot of robustness in the final results; that we believe that if a strategy has net present values that are positive within those discount rates, then it's very likely that they'll have those same positive benefits in the real world.

MR. KELLER: I'm just wondering because the cost of money is certainly much less than what you're talking about here, and what the effect of using those high discount rates pushes the emphasis on short-term strategies.

MR. FONG: That's correct, and that's why we're also using a lower discount rate. I think, though, that historically return on private investment has hovered around 10 to 12 percent. And so we're basing this on historical sorts of experience with these discount rates.

MR. KELLER: Thank you.

MR. FONG: Any other questions? Great. So, we're going to jump to our next speaker.

MR. ASHUCKIAN: Good afternoon; I'm David Ashuckian with the California Energy Commission, the light duty vehicle program. And I'm going to discuss the fuel efficiency strategies of our analysis.

There are five primary strategies within this category. The first one uses higher fuel efficient vehicles across the fleet in the new vehicle purchases. And in that strategy we're actually looking at three different subcases based on various advancements in technology and cost.

The second strategy is looking at the use of more fuel efficient or low rolling resistant tires in replacement tires, as well as better utilization of proper tire inflation.

The third strategy is looking at purchasing the most fuel efficient vehicles for government fleets that are available by class, and this is looking at the current technologies that are available.

The fourth is looking at improvement in vehicle maintenance practices. This is

essentially to get people to maintain their cars in order to increase the fuel economy of them.

And the last being much like the first, although it's for heavy duty vehicles, and that is looking at the more efficient heavy duty trucks. And that would displace diesel.

Now, what we'll do here is look at -- we'll start with a summary of our preliminary results of each of these measures. And then we'll look at two of the measures, the higher fuel economy, as well as the tire strategy, in more detail to show what we've done in going through our assumptions and our methodologies in the analysis.

This is a summary table showing the magnitude of the results for the various strategies. And here it gives you an idea of basically, you know, how they compare with each other. Some of these apply to only new vehicle purchases; some of them apply across the fleet, depending on the strategy.

Again, these are preliminary results, and we are continuing to make adjustments and refine some of the assumptions as well as what the ultimate results are.

This is basically an overview of the fuel economy case. And what we are doing here is evaluating the three cases, as I mentioned.

The first case is essentially using off-the-shelf technologies including mild hybrids across the new vehicle fleet. And in a minute here I'll ask Chris Kavalec to come up and explain, and we'll go through that case in detail.

The second two cases of this particular strategy includes the second case is a more moderate advancement, using more advanced technologies at a higher cost. So essentially the average fuel economy of new vehicles would increase, but that would include more advanced technologies as well as higher cost vehicles.

The third case is essentially using the most costly, as well as the most advanced technologies that we are aware of today in new vehicles.

And again what we're doing for our direct benefit analysis is looking at the direct cost of the vehicle, itself, compared to what the consumer saves in fuel savings.

So, with that I'll ask Chris to come up and he'll explain in detail the results of our

case one.

MR. KAVALEC: Okay, as David mentioned I'm looking at one case that we are analyzing for higher fuel economy. And in this case the higher vehicle fuel economy comes about through national fuel economy standards that are raised to 38 mpg for new cars and 26 mpg for new light trucks by 2015. And the corresponding numbers in 2020 are 41 and 28.

And this is based on an analysis by K.G. Duleep, who is a consultant working for the Energy Commission, who is a world renowned expert on vehicle technology. This case is basically an attempt to gauge the effects of maximum fuel economy improvements based primarily on conventional vehicles using currently available technologies, things off the shelf.

Examples include variable compression, six-speed automatic transmission and so on. It also assumes some weight reduction, a little bit less than 10 percent weight reduction to improve fuel economy.

It also assumes that 42 volt mild hybrids are widely available, offered by manufacturers, where this technology is geared

toward fuel economy improvements. So it includes idle engine stop and regenerative braking and so on. Which leads to an mpg improvement over the gasoline counterparts, similar gasoline counterparts of 9 to 12 percent.

And all the other assumptions are as in the basecase, fuel price, population growth and so on.

A couple of examples of the impacts of this standard on individual vehicles. Gasoline compact car, the price increases by $850 with an increase in fuel efficiency of 11 mpg by 2020. So you're paying $850 more for a compact car, and getting 11 higher mpg.

Example two: A large SUV; the cost there is $800; mpg increase is 6. A little bit less, but in terms of gallons per mile, it's actually comparable to what's happening to the compact car.

And here are the results which you've seen once already in terms of gasoline demand reductions. Demand reductions are increasing over time as more and more of the fleet is affected. The first year obviously only new vehicles will be affected. The second year new vehicles and one-

year-old vehicles and so on down the line.

Here's a graph. This is meant to show that the standards can have a dramatic impact on gasoline demand. The basecase and the case I'm currently talking about below it. You can see that it flattens out, gasoline demand basically flattens out by 2013 or so due to the higher standards.

Then as the population and income begin to grow at a faster rate than fuel efficiency is growing, it begins to turn upward again. In this case we're assuming that there are no further increases in the standard by 2020, so you can see that after 2020 gasoline demand begins to increase at a steeper rate.

Okay, this next slide shows the net consumer benefits from higher fuel economy. These exclude the environmental benefits, as Dan pointed out, and they also exclude the impact on government revenues. So it's just simply the impact on private consumers from having the standard in California.

Now, these are net present values, so you see that first number there, 1925, that's the net present value of net benefits from 2002

through 2010. Then the next number, 9828 is the net present value of net benefits for consumers from 2002 to 2020. And so on.

Also, below it it shows the net consumer benefit per household per vehicle. So that first number there, 86, what that is is it shows the net benefit on average per one vehicle household. So if you're a household that has one vehicle you can expect $86 worth of benefits in net present value form between 2002 and 2010. And then they increase as you go, 409 and 617.

DR. LONG: Excuse me, this is case one. Do you also show the numbers for cases two and three?

MR. KAVALEC: No, since we haven't done them yet we don't have any numbers.

Okay, so why do we have these positive net benefits here, what's going on? Well, what these results are suggesting is that there is a feasible mix of vehicles and associated fuel economy technologies not being offered currently, but if they were offered, could make the average vehicle owner better off.

And this doesn't mean that automakers are not responsive to customers in California;

it's just that they're not perfectly responsive.

And also we're not suggesting here that, we're not trying to say that we think vehicle owners really prefer little subcompacts over large SUVs. What we're saying is that for a given vehicle class, for example large SUVs, the addition of some fuel economy technologies can make a driver better off in California.

With that I'll hand it back to David.

MR. ASHUCKIAN: Okay, we can go ahead and wait for questions at the end.

The second strategy we're going to go into is the tire, replacement tire and tire inflation strategy. In this strategy we looked at the study by ACEEE that indicated that manufacturers offer lower rolling resistance tires on new vehicles as compared to what is generally available to consumers in the aftermarket tire replacement tire market.

So what we did here was made some assumptions. One is that a vehicle over its life will go through about three tire changes over its life. That means that about 60 percent of all the vehicles on the road are running on aftermarket replacement tires.

We then assumed that using a NITSA study that indicated that about 30 percent of all vehicles are actually running on under-inflated tires we estimated that we could actually increase the number of vehicles that are running on properly inflated tires by a campaign to encourage people to fill the tires up.

And so we basically assumed in both these cases an education campaign could increase the number of people who are either under-inflating their tires or don't check their tires often enough, or who are not purchasing the most fuel efficient tires available by about 50 percent. So we're not saying that we're going to get 100 percent of people to do the right thing for fuel economy, but that some people would realize that there's a benefit.

And in this we also evaluated the potential for the Treat Act, which is a recently adopted measure by the federal government to provide for inflation detecting devices on new vehicle sales. And we believe that essentially because that particular activity is not part of our basecase, it would only serve to actually improve the penetration level of vehicles who are

running on properly inflated tires in the future.

So here we have the strategy again which you saw earlier on the potential reduction. Now this is the combined for both the replacement tires, as well as -- the low rolling resistance replacement tires as well as increasing the use of proper inflation.

And it turns out they're just about equal based on the assumptions that we used, that you can get just about as much fuel economy from proper inflation as you can from the low rolling resistance based on the size of those populations.

And again, the tire replacement measure affects 60 percent of essentially all vehicles in California. The under-inflation measure affects the whole fleet, in that we assume that 30 percent of the whole 22 million vehicles in California are potentially not running on hard tires, so to speak.

Here again is the preliminary cost/benefit analysis on this one. And what we did, we assumed that it would take about an $8 million public campaign to educate consumers on both the value and benefits of both low rolling resistance tires as well as inflating their

vehicles properly. And part of this might also be some aftermarket devices to encourage people to monitor their tires more closely.

We also believe that we need to have a testing and labeling program in California so that consumers are aware of the different products that are available. One of the things we did find out is that although there are low rolling resistance tires available in the market the average consumer has no information, and even your tire sales person has no information about what the different specifications are with those tires.

Now, we based our estimated cost of the new tires on the ACEEE study on the cost of producing a lower rolling resistance tires. Their study said that the actual cost of those tires is about $5 per tire compared to an average tire.

We assumed that the retial price of those tires would end up around $10 per tire, and thus the consumer would have to pay about $40 for a set of low rolling resistance tires. That works out to about $13 a year based on the life of that tire.

And with those assumptions, as well as the expected fuel economy improvements from the

tires we believe that the consumer would actually save about $42 a year in fuel savings from that purchase.

So, using those assumptions we ended up with actually net present value as indicated here, $274 million in 2010; $313 million in 2020; and 355 in 2030. So essentially even though the consumer is paying more for the tires, they actually -- and we're actually paying for a campaign and testing and labeling, the net benefits are positive on this one.

Now, some of the uncertainties of this one include what the true retail cost of low rolling resistant tires will be once they're widely available. Secondly, how well the information campaign would convince consumers to pay more for a tire up front in order to achieve savings; again the net present value to consumers is paramount.

And as well as we don't really know how many vehicles today are really using low rolling resistant tires as replacement tires because of the lack of information available on the various models.

So what we did on this particular

assumption was we assumed that 80 percent of all tires in the replacement market are not low rolling resistance tires.

Now what we're just going to do is describe the other strategies in our measures here to give you an understanding of what they are. We're not going into the details of the analysis on this one.

The fuel efficient vehicles in state government, basically looked at all government vehicles registered in the State of California, including state, local, as well as federal government vehicles.

And we essentially looked at what are the average fuel economy of all models available and then compared that to what the fuel economy is of the best model available in every class in the 2001 model year.

Now, it turns out that on average the best model year vehicle, the best fuel economy model of each class is about 6 miles per gallon better than the average vehicle in that class. And using the full size of all government fleets, we can get a significant amount of reduction from this.

Now, unfortunately EPACT requirements require government fleets to -- actually federal and state government fleets to purchase alternative fuel vehicles or bi-fuel vehicles to meet EPACT requirements. So we believe that, you know, there are some limitations on what a government can do in order to buy a more fuel efficient vehicle because they still have to meet their EPACT requirements. So this would likely take some modifications to EPACT in order to fully implement this.

And in addition there are some issues regarding -- uncertainties regarding the ability to convince fleets to purchase the most fuel efficient vehicle if there's some special purposes that that vehicle's being used, such as emergency pursuit vehicles, et cetera.

And basically the other issue is the size of the State of California's fleet, this is just state government vehicles, is only about 10 percent of all government vehicles in California. So there'd be a question of how we'd implement this to fleets that are not controlled by the state at this point.

The next measure is increasing or

encouraging consumers to improve their service on vehicles. And basically this one looks at how changing your oil more frequently and replacing your fuel -- air filter more often could improve the fuel economy of your vehicle.

This was looking at DOE numbers on the effect of proper maintenance on fuel economy. And what we did here was assume that the state smog check program is, in fact, insuring that consumers are in fact tuning up their cars to meet the minimum requirements of their smog check. But, in fact, aren't necessarily replacing their oil and air filters on the recommended interval that the manufacturer suggests.

So what we assumed here was that, again having an information campaign could, in fact, increase the number of consumers who replaced their oil filters, air filters and oil on a more ambitious interval in order to gain some fuel economy benefits.

And here the costs are comparing the cost of the additional oil changes and the fuel and filter changes with the cost of saving the fuel.

And the last measure is looking at more

efficient heavy duty trucks. This one assumes that we adopt some sort of measure to insure that trucks that are for sale in California beginning in 2010 meet DOE's 21st century truck program targets.

Those targets basically say that the fuel economy of trucks available in 2010, the class A trucks will double compared to the model year 2000 fuel economy. And for class 3 to 6 trucks, the medium to heavy duty trucks, will actually triple from 2000 model levels. So, again, these are vehicles beginning in 2010.

Now we do have the assumption that technology will advance before 2010 and that there will be some introduction of these vehicles before that. So, it doesn't just all happen starting in 2010.

And, again, here the cost benefits look at what the expected cost of the technology is compared to the fuel savings to the truck driver.

And with that, that's the end of the section and we'll entertain questions on both entire strategies, as well a the fuel efficiency strategies.

Why don't you go ahead and step up to

the mike, please.

MR. KELLER: This is John Keller again. I'm wondering if on the change in vehicle fleets question there was some discussion about the change in fuel economy and that those were all improvements to compacts, SUVs, et cetera.

So are you projecting any change in the fleet mix between large and small vehicles?

MR. ASHUCKIAN: I'll let Chris go ahead and answer that.

MR. KAVALEC: The answer is basically no. We do use CalCars which is a choice model. So the choices of subcompacts versus SUVs and so on will be slightly different with the higher fuel economy standard, but not dramatically different. So there's going to be no major shifts from SUVs to subcompacts or vice versa.

MR. KELLER: And how about any impact in terms of the tire inflation strategy? Are you projecting any benefits from fewer collisions based on better performing vehicles?

MR. ASHUCKIAN: No. Our indications are that the actual -- that there is potential safety implications with tires, although it looks like those are fairly minor. That lower rolling

resistance tires don't necessarily affect your stopping distance or change the effect of the tire significantly. And so there's really no change.

We also think that the actual fuel economy improvements are pretty small, so that really doesn't have a significant effect on people's driving habits. You will save money but it's, again, you know, over the course of a year.

MR. KELLER: I was really talking about better inflation of tires, so you've got the SUV issue and you've got just better performance --

MR. ASHUCKIAN: We haven't looked at the safety implication of more penetration of properly inflated tires. Again, with our assumptions on 30 percent of the fleet having low inflation tires, you know, those aren't necessarily flat tires, they're just not at the recommended pressures.

And a 50 percent improvement in that is 15 percent of the fleet. So, it's not a significant number of vehicles in that sense. But again, it's maybe a few psi improvements in some vehicles. It's not flat tires necessarily.

MR. TURNER: Sean Turner, California Natural Gas Vehicle Coalition. I just have a question regarding the net consumer benefits, the

units associated with that.

Are we just talking about dollars of gasoline purchases saved, or you assume you're talking about benefits, you're trying to understand how you quantify what those benefits are. Is it just dollars in gasoline purchases saved?

MR. ASHUCKIAN: In this part of the analysis we are strictly looking at the cost, the savings that the consumer gets from buying less gasoline.

If there are -- well, that's really about it. There's no -- but we're comparing that to the cost of the program. For instance, if the government pays for something to have that happen that's included in that cost.

MR. TURNER: So it's dollars invested per, you'd get back dollars invested per dollars of gasoline saved. Have you thought about adding in any other external costs that the consumer is going to benefit from not having to pay because they've switched fuels or what have -- I mean, you know, if they don't have to purchase an extra gallon of gasoline there's several things that go along with that reduction. Other external costs

associated with it.

MR. ASHUCKIAN: We're not looking at, say, how much there is savings in time that a consumer saves from going to the gas station less often.

MR. TURNER: I guess I was thinking more in terms of what the industry is spending to supply, let's say, each of those incremental gallons of gasoline, whether it's other environmental costs associated with underground storage tank, or remediation, or even, and this is a difficult one to quantify and I'm not asking you to do this, but even the cost of, you know, maintaining presences in countries that are somewhat hostile and having to support those things to supply us with the additional gasoline.

MR. ASHUCKIAN: Those are --

MR. TURNER: I mean there are other external costs that I'm wondering if we're trying to quantify any of them.

MR. ASHUCKIAN: Yeah, those are in task three, those are the indirect benefits -- task one, yeah, task one, those are what ARB is doing in the environmental and indirect benefits to reducing petroleum use.

It is not part of this particular analysis which is just looking at the savings of gasoline costs. Again, those are being addressed in the study.

MR. TURNER: Okay, thanks.

MR. HINDERKS: Mitja Hinderks, Litus. Awhile ago California introduced LEV and ZEV legislation independently of the federal government; it was a California law.

As far -- is anyone aware of any consideration being given for California to unilaterally impose its own CAFE standards independent -- I don't know if it's legally possible -- independent of the federal standards? And then presumably if they were higher then manufacturers would have the option of either producing a slightly more expensive version of a car sold in other states, which met the improved fuel economy. Or they would have an option of adjusting the mix, restricting the sales of the gas-guzzling SUVs, whatever, and pushing the sales of the more fuel efficient vehicles?

I'm just curious to know whether this is possible or perhaps even likely that California might introduce its own CAFE standards.

MR. FONG: That's a very good question. In fact, I think that that's going to be part of the overall effort that's going to be produced in this report.

If you followed this morning Mike Jackson on the overall program plan, there is an element there where various policies are going to be evaluated. And the question that you pose is really a policy question. And that question should be should the State of California independently adopt regulations similar to national fuel economy standards.

The work that we're doing, though, is looking at the what-ifs if those kinds of higher fuel economy vehicles are actually available what would be the consumer response to those vehicles. Could we project a positive net present value based upon the considerations that we're using to try to evaluate the merit or value of those strategies.

And so to answer you briefly, is yes, that we will be looking at a potential policy, I think, that might be independent from some federal strategy. But we can't tell you today what the results of that particular scenario might be.

MS. MONAHAN: My name is Patricia Monahan; I'm with the Union of Concerned Scientists. And I want to first thank you all for doing this work. We realize it's been quite a task that you've taken on, and we appreciate all the hard work that's gone into this.

I have a question and a comment. My question is the analysis that you did in terms of consumer behavior modification, consumer choice, changing their behavior by 50 percent for tires and for maintaining their vehicles, is that based on any studies? Is there some, you know, a dollar input in terms of consumer education will give you X output in terms of consumer behavior?

MR. ASHUCKIAN: No. It's based on what we believe, you know, is a reasonable estimate if we provide accurate information to consumers, and essentially show them the positive benefit. But we don't have any behavior studies to show how much they would be willing to change their behavior for an X dollar amount.

MS. MONAHAN: Yeah, if you find one of those studies I'd really like to see it.

The other, the comment I have is that we've done a study on the amount that fuel economy

could be increased with technologies that are available today. And we estimate that a 40 mpg increase across the board for both cars and light trucks is feasible with today's technology. That's phased in by 2012.

And in terms of impacts we find that in California our model's not as sophisticated as CalCars, but we're doing a looser estimate that California could save 3.2 billion gallons in 2012 through a fuel economy increase of 40 mpg. And we think that's feasible.

We've also, our estimates are substantiated by the National Academy of Sciences, which also anticipates that within the next 10 or 15 years that fuel economy across the board, both cars and light trucks, could be increased up to or close to 40 mpg.

So, I'm just curious as to why, I mean I realize that California has limited ability to change CAFE on the national level, but I'm curious as to why you took a more conservative position on that.

MR. ASHUCKIAN: I don't think we really are. What we've shown you is case one of our three cases. That is the most conservative

estimate for fuel economy improvements.

The second two cases are more aggressive than that; and in fact, I think -- you said 40 miles per gallon, that's almost -- our case one is just about there for the cars. The cases two and three are more aggressive, and I think we'll actually go beyond 40 miles per gallon for those cases.

So, in fact, we are -- again, we're identifying what the costs and benefits are of these various cases depending on how far you want to go with the fuel economy.

MS. MONAHAN: Right, I guess I would just say then that 40 mpg, in my mind, across the board, cars and light trucks, and we really need to include light trucks, should be conservative. That should be the basecase. But we can go much further than that. I mean we're anticipating that we can get 40 mpg with technologies that are available today. And so does the National Academy of Sciences.

So, I would just prefer to see a basecase that reflected what today's technology could give us. And, you know, the more advanced technologies then we could go up to 55 or greater

mpg. But just I would prefer to see a basecase that reflected the technologies that are available today.

MR. ASHUCKIAN: Okay.

MR. STAMETS: I just want to make one comment because it will kind of probably continue in our analysis. As we mentioned we've used K.G. Duleep's analysis. And he was a consultant with the National Academy of Science Committee.

And, you know, it is his analysis, but basically it's one assessment of what the available technologies can do. And as far as I know it's a credible assessment. If we find out it isn't, well, then we shouldn't use it. But so it is one.

Now, the way I see it is that there are other assessments, and maybe they're equally credible, but there are simply different assessments. And this is one looking at, you know, there may be certain technologies that one group feels can be used and others may feel are duplicative of certain technologies. So that's just what I'm putting on the table.

MS. MONAHAN: Yeah, I appreciate that. I think, though, the National Academy of Sciences,

I mean that -- it's a distinguished body of scientists that are participating in that panel, and they said, you know, I think 37 miles per gallon is their most recent analysis. But that's for cars and light trucks.

I'm just curious as to why it was only 28 miles per gallon for light trucks. That's the issue I have with it.

MR. ASHUCKIAN: Again, that's one scenario. Our two other scenarios are going to be much more aggressive than that.

MS. MONAHAN: Thank you.

DR. LONG: Russell Long, Bluewater Network. First I would like to echo Patricia's comments, once again because, you know, we understand that there's going to be more aggressive scenarios plotted out in case two and case three, but for the baseline case in case one the blended average here, or combined average on case one is really 32 miles per gallon, the 26 plus 38, divided by two. I think it's 32. And that's a significant percentage below what the National Academy is talking about. So, you know, we'd urge you just to reconsider on that.

Now, in terms of other things I wanted

to address a question that had been raised earlier about California establishing its own CAFE standards. And I'm not sure everybody's familiar in the room, but we're preempted by federal statute from developing our own CAFE standards. Any state is preempted on that score.

However, we've introduced legislation that we expect will be on the Assembly floor in the next couple of weeks, AB-1058, that would have CARB develop the maximum feasible cost effective reductions of CO2 from the passenger vehicle fleet.

And because of manufacturers' maximum flexibility in how they do that, in other words, this need not entail any changes in corporate average fuel economy or fuel efficiency. It may involve a number of other strategies that could, for example, encourage rideshare programs or telecommuting programs, or the use of more natural gas vehicles and so forth. Even the replacement tire option is probably a possibility.

But we would ask you to take a look at AB-1058's language and see if it would be possible for this report to essentially endorse that type of legislative activity. Obviously it could have

a significant bearing upon reductions of petroleum use in the state.

And I don't know whether these comments really belong in this section or the next one, under fuel displacement strategies. But I thought I'd throw that out anyway.

I also wanted to mention that we filed a lawsuit, along with the Sierra Club and Center for Biological Diversity, on EPACTs 92 claiming in our claims the federal government, particularly the Department of Energy and 17 other agencies, have not done what they need to do to achieve their alternative fuel use requirements under the Act. And in fact, they're probably hovering around 20 percent right now, from our best guesses and some FOIA documents that have come back.

They need to be, I think the number's 50 percent now, but by 2010 they need to be at 75 percent.

Now, at some point we'll enter settlement discussions and we can probably talk to them at that point about amending, you know, seeing if there could be some amendments to try to get the higher mileage requirements that you're talking about in here. So we should certainly

talk about that.

On SmogChek I also wanted to mention, I think there's something we're leaving on the table there. SmogChek has not been that aggressive a program by and large, and a lot more could be done. I know it's legislatively a bit of a hot potato sometimes, but I think it needs to be investigated further to see what we can do. There may be some benefits there to be gleaned.

And finally, I wanted to ask on another legislative question, whether it would not be possible to look at the option, the legislative option of requiring certain technological elements that hybrids use in order to increase fuel mileage.

And, again, you know, potentially that's preempted. I know that might be, you know, a legal question that needs to be answered. But, to the extent that the state has the ability to require certain technologies in vehicles quite independent of fuel mileage related issues, I think perhaps it's worth investigating. So I would encourage you to take a look at that, as well.

Thank you.

MR. CHURCH: Hi, I'm Zach Church, the Office of Assembly Speaker Pro Tem Fred Keeley. Two questions on tires.

One, did you consider any incentives that you could provide to service stations to encourage people to properly inflate their tires?

And two, how much would it cost to run an effective public education program?

MR. ASHUCKIAN: First of all, part of the $8 million we anticipated for the public campaign is kind of an estimate of everything would be lumped into incentives to maybe even devices to consumers that could monitor their pressure. So we didn't actually list out specific activities, but just kind of used a ballpark of what we thought was an effective campaign.

Again, one of the things is, you know, there are multiple levels of public campaigns that could be launched. And, again, we didn't go into the details. A lot of these strategies, what we're talking about here and some of the things that Russell brought up, are really implementation issues that we didn't really focus on in our analysis at this point. We're focusing on if you got these benefits what would the overall cost

effectiveness be.

So, we haven't really focused a lot on implementation issues and how much could be achieved based on what type of implementation you did. That answer your question?

MR. CHURCH: Yes.

MS. ELLIS: I am Staci Ellis with the California Trucking Association. And I apologize for the ridiculous state of my voice today.

When discussing the double model, your 2000 fuel economy for trucks by 2010, does that also take into account any potential future fuel reformulations that there may be in California?

I know we'll all be using 15 ppm fuel at least by 2006; and if I read CARB as I usually do fairly correctly, I know we won't even be using that by 2010. I'm sure there will be more reformulations by then.

So does that number take that into account, as well?

MR. ASHUCKIAN: It takes into account, yes, that the fuel formulations that are going onto the books are part of what is necessary to achieve these technology advancements. Yes.

MS. ELLIS: Okay, because when

California first reformulated fuel our fuel economy for diesel trucks was hit pretty hard. And I'd love to see double the economy that they're getting now by 2010. I'm just hoping that that will be possible with the future reformulations.

MR. ASHUCKIAN: We do, too.

MS. ELLIS: Thank you.

DR. McCANN: Richard McCann from M.Cubed. A couple of questions. First one, do you have documentation of how much these fuel economy improvements will cost for both automobiles and for heavy duty trucks? Do you have that available?

MR. ASHUCKIAN: These are --

MR. KAVALEC: We do for the light duty vehicles.

DR. McCANN: Right, so how do we get a set of that, of those inputs?

MR. KAVALEC: I just mentioned yes, that we do have the documentation. And if you leave us an email address we can email it to you.

DR. McCANN: Okay. But you don't have that yet for heavy duty vehicles? You haven't gotten into that level yet?

MR. KAVALEC: No, I don't think we have.

DR. McCANN: Second question. I've seen at least three studies of which one was from the NRC, on increases in accident rates associated with increased CAFE standards. Are you incorporating that into the analysis?

MR. KAVALEC: Yeah, there is some evidence that shows that the CAFE standards of the last 20 years have increased highway fatalities because of weight reductions.

And our model CalCars right now is not equipped to include specifically safety factors. However, I just want to say that there are ways of structuring standards to avoid that weight reduction problem.

For example, one idea that's being kicked around is weight-based standards. Or it could be a reduction only -- part of the problem also is the distribution in weight. You have a lot of heavy vehicles and a lot of lighter vehicles.

You could also reduce fatalities if the standards were to reduce the weight of some of the larger SUVs and trucks.

MR. FONG: Let me also add that in

September of last year at our first workshop we had a presentation made by David Green of Oakridge National Laboratory. He was one of the members of the National Academy of Science study that was recently provided to the Congressional organizations.

And he made a very compelling argument that the conclusions regarding vehicle weight and personal injury and fatalities was not necessarily a cut-and-dried conclusion. There's a lot of compounding data or lack of data to really, I think, conclusively make that statement that reducing weight automatically increases personal injury and fatality.

I think what we certainly would suggest is that additional study and information be collected by the National Academy of Sciences to further examine the linkage between vehicle weight and personal injury. I don't think it's correct to automatically assume that that's the effect of reducing vehicle weight.

MR. ASHUCKIAN: Looks like there's no other questions. We'll move on to our next speaker, which is the fuel displacement strategies. Dan.

MR. FONG: Well, I hope everybody has a full quiver of arrows.

(Laughter.)

MR. FONG: The next category of strategies that we're evaluating are fuel displacement strategies. And we've really broken this up into the two major onroad market sectors.

There are a number of fuel displacement strategies that work well with light duty vehicles, and so we're targeting the reduction of gasoline in those cases.

And there are also a set of displacement strategies that are applicable to the heavy duty vehicle sector. And so we're focusing on reducing our potential future consumption of diesel.

These different strategies fall into two major types or combination of types. They involve advanced transportation technologies that we are postulating that technology will improve over time to then allow some of these displacement strategies to penetrate the marketplace.

We're also looking at a variety of alternative fuel candidates that today appear very promising, and that we make assumptions regarding the evolution of those alternative fuel

technologies, again to see how they might penetrate the market.

Common to all of these displacement strategies is a scenario methodology. We're assuming that if a variety of policies or measures were adopted we can increase the market penetration of these particular displacement options.

The assumed pathways for these options include advancing the technology performance; reducing some aspect of their cost; and then resolving infrastructure limitations. These scenarios contain in our minds plausible conditions and potential projected outcomes.

We're also going to try to develop some common point or points of comparison between these different displacement strategies. Those points may not necessarily be the optimum point. But it still allows us to then look at each one of these displacement options and see how they measure against each other.

For the light duty strategies, focusing again on gasoline, we're planning to look at fuel cells, electric battery technologies, basically looking at how current battery or electric

vehicles might improve over time. We're also looking at increasing the use of compressed natural gas in light duty vehicles.

We're examining the potential of liquified petroleum gas in that application. We're looking at the use of ethanol in fuel flexible vehicles. And the last item here is what might happen for light duty vehicles in terms of increased diesel fuel penetration.

And what I'm going to show you now are the basic assumptions or some of the key assumptions that are currently within these different strategies.

We don't have specific results to show today. I'm sure all of you recognize that these particular scenarios are much more complex than most of the other strategies that we're going to look at. There are a host of assumptions that we have to make in order to build a credible pathway to reach these sort of end-points where these strategies begin to have an effect in the marketplace.

So for fuel cells we're assuming that at some point fuel cell vehicles will have an efficiency of 1.5 to 2.5 times that of a gasoline

car. Our information shows that the lower end might be achievable with some gasoline-based fuel cell technology. The higher end is based upon a direct hydrogen fuel cell technology.

At some point we believe that this technology will have comparable gasoline car power, range and load capacity.

The two leading candidates for the hydrogen sources that go into these fuel cells, one will be either a methanol hydrogen carrier or a direct hydrogen type system. And then the other competing system will be a gasoline or naphtha based fuel cell.

Currently our understanding of the infrastructure costs per site is anywhere from $400,000 to $750,000 per installation. We believe that at some point when these vehicles are ready for commercial introduction they'll carry with them an incremental cost of anywhere between $8000 to $13,000. That range, of course, can change as this technology improves and matures. That differential may be reduced.

There may also be other future costs comparisons with other vehicles that will be in the marketplace at that time. So that

differential may well change over time. But for now, in our strategy, we're looking at that kind of a vehicle incremental.

We also believe that a commercially attractive vehicle might see some commercial introduction around the 2010 timeframe.

For the electric battery technologies strategy, we're assuming that some continued investment in battery development can continue to reduce the unit cost of current battery systems that go into electric vehicles.

In the study that was conducted by the Air Resources Board and published by their advanced battery panel, they have concluded that the current battery cost is something on the order of $20,000 per unit, can be reduced to roughly $13,000.

This mean that in the future, at least, there is this potential of continuing to reduce these battery costs. It does make some assumptions about the annual battery production level. We're assuming that we can reach 100,000 units at some point in time. That still leaves, though, a $13,000 vehicle incremental cost. We're assuming that vehicle purchase will still be

supported through some incentive mechanism that provides up to $9000 per vehicle.

In this particular strategy we're assuming that this development begins as soon as 2003, and that advances continue to be made. And then at some point we can realize these costs.

For grid connected hybrids, which is in some sense a form of an electric vehicle, again this is based upon the assumption that batteries continue to be reduced in cost. Because grid connected hybrids use a smaller battery pack as compared to an all electric vehicle, the battery for a grid connected hybrid may only be about $7000 per unit. And that also turns out to be the vehicle incremental cost.

This system, we believe, can provide 50 percent of its entire VMT using the battery system alone, but that it is joined with an internal combustion engine that has a fuel economy performance level of 30 miles per gallon.

We believe also that this scenario can be started in the 2003 timeframe, leading to some penetration rate in the projection years of 2010, 2020, and 2030.

For compressed natural gas in light duty

vehicles, we're assuming that some form of home refueling becomes commercial. That home refueling, we believe, is critical to advance larger numbers of these vehicles into the marketplace.

The vehicles still will have a vehicle incremental of about $3000. The cost of the home refueling unit is about $1000. We believe that under this scenario that CNG vehicle model offerings will increase to meet potential growth and demand.

We also see, though, the need for increased deployment of public refueling infrastructure. And that will be tied to the vehicle penetration rate that will be examined under this strategy.

We still believe that some form of public/private investment is needed to reduce these vehicle costs and deploy that fueling infrastructure. For this strategy we're assuming that that investment is on the order of $3000 per vehicle.

In the LPG case we believe that the annual sales of new LPG vehicles can be maintained at the current rate of about 1000 units per year.

We're assuming that buying and owning this type of vehicle will be comparable to a gasoline car. It will have comparable gasoline car fuel economy, but the models of vehicles that we see for this particular technology will be comparable to a gasoline vehicle that is a little larger than the typical passenger car, but that that gasoline vehicle is currently running at around 12 miles per gallon.

We do not anticipate the need for any additional fueling infrastructure. Currently I think there's over 1000 propane fueling sites, public propane fueling sites available in California today.

We also anticipate under this strategy a larger number of LPG vehicles being offered by original equipment manufacturers. But we also believe it's important to have conversion kits that are available and certified to California emission standards.

In the ethanol and fuel flexible vehicle case, we recognize that a number of the major auto manufacturers are producing fuel flexible vehicles for sale in California. These vehicles can use essentially any combination of gasoline and

ethanol fuel up to E85.

Now, to take advantage of those vehicles entering our fleet we believe that there might be a case where ethanol is used to fuel those vehicles. That requires that the current federal CAFE credit system be maintained for fuel flexible vehicles.

This strategy assumes that the major domestic manufacturers will seek a maximum CAFE credit which is currently available to them. That means that they would increase their model offerings to obtain that maximum CAFE credit.

But that also means that the emission certification level of those cars continue to improve, so that they still meet California requirements.

We also believe that an E85 fueling infrastructure needs to be deployed; and that that deployment will be tied to the vehicle population rate under this strategy. We are assuming that each fueling site needs roughly 750 cars to generate sufficient revenue to make it attractive to fuel retailers.

We are assuming that each site will require approximately $50,000 in infrastructure

investment to convert an existing storage and dispensing system, to then dispense ethanol. We believe that the ethanol will be blended onsite with the existing gasoline to make the E85.

We believe that a station or site density of roughly 10 percent of all public fueling sites in California will have this E85 available in order to generate the kinds of reductions that we're projecting.

In essence, in this particular strategy, the fueling aspect becomes a near transparent activity. It would be basically very similar to gasoline.

In our light duty vehicle case we're assuming that that technology will meet California emission standards by 2007. At that timeframe we believe that that technology will still carry with it an incremental cost of somewhere between $1200 up to $5000. And that would include any additional emission control cost required to meet the 2007 standards.

This technology would have a 40 to 45 percent fuel economy increase over a comparable gasoline car. The emission control technology, however, may require additional infrastructure.

And we're assuming that that emission control technology at this point in time would require some form of urea to be employed in the vehicle emission control system. And so we're anticipating the need for some form of public/ private investment to deploy that kind of infrastructure.

We also see that it's important for this particular strategy to unfold. A truck CAFE still needs to be in place. And basically that would push manufacturers to look at available technologies to meet those fuel economy standards. And we believe that diesels can offer that type of efficiency improvement.

Now, on the heavy duty side we have a shorter list. And I'll describe again the assumptions that we're going to make for some advanced natural gas engine use in heavy duty vehicles that is a greater penetration rate of that technology.

We're also looking at a Fischer-Tropsch Diesel strategy. And then thirdly, a biodiesel strategy.

In the advanced natural gas engines for heavy duty vehicles, we're assuming that in 2020

advances in natural gas engines will allow that technology to be comparable to diesel engines in terms of their performance, reliability and durability.

We have used historical incremental costs to project the future cost reductions that might occur for this type of technology.

We still believe that some form of public/private investment needs to be made for fueling infrastructure, particularly for fleets and transit properties, but that that fueling infrastructure probably would involve both CNG and LNG refueling capability.

This scenario also assumes that the natural gas equivalent fuel costs will be less than diesel.

In the Fischer-Tropsch strategy we see the possibility of policies adopted where this current synthetic fuel can be used to a greater extent than it currently is in California. This would require a world oil price of something on the order of at least $20 a barrel.

This strategy also assumes that the projected supply of Fischer-Tropsch Diesel is realized. It also requires that the California

diesel fuel specification for aromatic content and cetane number continues to make Fischer-Tropsch Diesel an attractive blending ingredient.

It assumes that there is adequate availability of low cost, remote natural gas. That's the current resource being used for the production of Fischer-Tropsch Diesel. And that some early form of public/private investment is needed to spur increased marketshare for the current production of Fischer-Tropsch Diesel.

Last, we have biodiesel. There's currently a potential need for a lubricity ingredient in diesel fuel. Biodiesel offers that particular characteristic. There's also the potential of biodiesel being more highly valued because it can reduce the emission performance of heavy duty vehicles in terms of the hydrocarbons, CO and particulate matter emissions.

This strategy assumes that the national biodiesel supply increases to 6 billion gallons by 2020. That the current incremental cost over a diesel fuel is something on the order of 75 cents to $1 per gallon. And that we're looking at various blend levels of 1 to 3 percent for lubricity and a potential case where B20, which is

20 percent biodiesel blend, or 20 percent biodiesel blend with diesel fuel, enters the market in a larger volume.

So that concludes the fuel displacement strategies that we're currently planning to evaluate in some detail. We certainly welcome any suggestions from the audience and stakeholders on additional cases that merit some consideration.

So, I'd be happy to take any questions at this time.

MR. POHORSKY: Hi, I'm Jerry Pohorsky. And I'm here representing myself. I'd like to just thank you for your fine work, and to recommend going forward with three of the options that you propose, because they use technology that's already tried and true. And I've used it myself over the last ten years.

And all of this technology has been available for at least five years, and scales well to large volumes.

A thousand propane vehicles a year seems like a drop in the bucket. We could easily go much higher than that.

I had a propane vehicle, myself. I went to self-serve station, so the fueling was trivial.

The cost was comparable to gasoline. Currently I drove up today in an electric vehicle that uses lead acid batteries, so the incremental battery cost for that technology is much less than the numbers you gave, because I think that's assuming nickel metal hydride or lithium technology. So for lead acid, it got me here from Santa Clara today, and it's good enough. And the incremental cost is not that high.

And I also use the flex fuel technology. Again, that scales well. You mentioned 10 percent penetration on the service stations. I believe all of the recent tanks that have been retrofit are alcohol compatible, so that potential roadblock has already been overcome.

So, those three options, I think, they're available now and some of these other ones you're talking about 2010. You know, we don't need to wait. We can go forward with some of these things while the other ones develop.

Thank you.

MR. FONG: Okay, thank you. Yes.

MR. WHEELER: Hi, Dan. Let me thank you, as well, for your work. And, Susan, very informative presentation today. I'm Doug Wheeler,

representing the Diesel Technology Forum.

And apropos the last comment, we need to say that light duty diesel is available today, as well, with the kinds of improvements in fuel efficiency that you've identified as a target for 2007, 2010.

In fact, my question might be whether you've assumed a high enough degree of market penetration for light duty diesel in the 2007 scenario. Let me say, assuming compliance with 2004 and 2007 engine and fuel standards, which the industry accepts.

MR. FONG: Well, we're looking at a number of different cases for potential light duty diesel penetration. I think a lot will hinge upon how we deal with this incremental vehicle cost.

Just off the back of the envelope we recognize that this relatively large vehicle incremental cost will have to be offset by some other consumer benefit. In some of these vehicles where consumers really value power and acceleration and hauling capacity, those benefits may be sufficient to have consumers pay that additional incremental cost.

But as this technology might spread over

more and more different model offerings, which may not have that service need in mind, then the consumer needs to see some additional benefits before, you know, writing a check for that additional high end cost.

But I think we're not ruling it out; that there are some very positive aspects about those types of vehicles. I think the key barrier still is its emission performance. Can we have these vehicles in California while meeting our emissions.

MR. WHEELER: The industry believes that we can. Certainly, given the availability of ultra low sulfur diesel, and certainly based, as you know, on the experience in Europe, where there's now 30 to 40 percent market penetration for light duty diesel complying with European community environmental standards, which in some cases are stringent, more stringent than California standards. Particularly with respect to CO2, as you know.

I would just say as you look at model projections of penetration, bear in mind that there is that high figure in Europe based on true-to-life operating experience, including individual

vehicles available there today that generate 80 to 82 miles per gallon without adverse environmental consequences.

MR. FONG: Thank you.

MR. WONG: Roland Wong, Natural Resources Defense Council. I'd also like to address this issue of light duty diesel vehicle assumptions and the role a light duty diesel vehicle may or may not play in the future of California and the national strategy to meet and address simultaneously our air quality and energy problems.

I guess from our perspective we do not believe the 2007 standards, as represented by LEV2, particularly the NOx standards and the PM10 standards under the California LEV2 program is sufficiently health protective. So the assumption that the -- I think there's an assumption embedded, it sounds like there's an assumption embedded in the scenario that the standards for light duty vehicle passenger cars and trucks are not going to be changing beyond the 2007 time period.

I think that's an incorrect assumption, particularly as we know gasoline vehicles, the

SULEV technology can be driven down to .02. My understanding is the Ford Focus diesel vehicle is demonstrating 05. That's not going to be sufficiently health protective. That's not going to be sufficient for California, and I think eventually the country, in order to meet its air quality goals as mandated by the federal Clean Air Act. So I think we're going to be going further on LEV3, for example, we would hope.

Second thing is PM10. Though the standards are in place that are more stringent in 2004, more stringent standards will come into place for light duty diesel vehicles, the PM10 is not the only health issue associated with diesel emissions.

We know that PM10, in fact, is probably not the right size of particulate matter to be focusing on in order to protect health. It has to be something lower than PM10, maybe even lower than 2.5. In addition, there's the toxic component of diesel exhaust.

And so just meeting 2007 standards is not going to be sufficient to protect air quality and public health in the future. So I think that needs to be addressed in these scenarios.

And the potential, from our perspective, the potential for diesel vehicles to undermine our ability to reach air quality goals, and protect and reduce diesel.

In fact, today there is a meeting over at the CalEPA building about reducing toxic risk from cancer -- from diesel emissions, both stationary and mobile.

And I guess we'd urge that we shouldn't be developing a strategy in this building which conflicts with the ability for CalEPA to meet its goals of toxic reductions. Thank you.

MR. FONG: Thank you.

MR. KOEHLER: Good presentation, Dan. A couple questions and comments. Neil Koehler with Kinergy Resources.

On the flexible fuel option, which clearly is a very effective and near term option when you consider there's probably somewhere in the order of 150,000 flexible fuel vehicles in California today, the obvious problem being none of those cars are running on ethanol.

What were your assumptions on how often the FFEs would be fueled with ethanol? Or is that still being developed --

MR. FONG: At this point one of the outputs we'll assume 100 percent usage. But we'll also look at, you know, lower usage rates, and/or what would affect consumer response.

The difficulty with the flexible fuel option obviously is because it can use gasoline. What measures might you have to adopt to encourage consumers to actually choose E85 over whatever other fuel that can go into the car.

You have to provide that consumer with some additional benefit to make them pick E85 over gasoline.

MR. KOEHLER: Right.

MR. FONG: And so that will be part of the scenario building that we will have to go through.

MR. KOEHLER: Yeah, and that's obviously important. Another, and that was to my comment, was considering what policy mechanisms could be used to put more teeth, whether they be more incentives at the state level, but certainly it would be the view of myself and I'd say generally those in the ethanol industry that if these FFEs are going to be effective, there somehow needs to be linkage in the CAFE credits program that if

there is going to be credits generated by the car companies, there's got to be some mechanism to insure that ethanol is used in those cars.

Otherwise it's really not satisfying the policy objectives. And so that might be something, you know, the state could consider. And obviously it's a federal issue, but we can all band together and somehow amend the CAFE process to make sure that the fuel intended is actually used to some percentage of the vehicle use.

And then I would add, sort of following up on my comments this morning, is that in response to your asking for other scenarios, if the use of ethanol blended into gasoline be very clearly identified as a separate scenario.

There is the issue of, you know, what is the baseline; and if ethanol 6 percent is the baseline, and that's replacing the nonpetroleum, you know, the natural gas was making the methanol, which is essentially about 5 or 6 percent in the MTBE, you know, then maybe that's baseline.

But we can go backwards from that if certain policies are adopted where we see no ethanol and go back to 100 percent petroleum hydrocarbon in the gasoline.

Or we can go the other way and go higher than the 6 percent. Brazil, which is the world global leader in ethanol use currently blends 24 percent. While the EPA right now will not allow more than 10 percent.

If we're starting to look out to 2030, '40 and '50, it's certainly very rational to explore the options of blending higher amounts than even 10 percent ethanol into the gasoline.

And when you're talking about, you know, 10 percent ethanol in 2020 when you're 20 billions gallons plus of gasoline, that's over 2 billion gallons of ethanol. So, in terms of petroleum displacement it becomes a very very significant lever.

So, we'd just encourage that we include that as a separate strategy in terms of these scenarios.

MR. FONG: Thank you.

MR. KOEHLER: All right, thank you, Dan.

MR. CAMPBELL: Todd Campbell, Coalition for Clean Air. I just want to kind of build on Roland's testimony earlier about, you know, diesel in light passenger vehicles. And the one thing I want to just clear and comment on is to refer to

European examples is, you know, in terms of emissions performance, is slightly misleading, considering that the fuel reformulations are completely different.

The fuel that we're going to be adopting is about 15 ppm. European standards are generally 10 to 5 ppm if not less than that.

So, with that said, the other thing I wanted to mention, and I was kind of surprised on the fuel displacement strategies for diesel, fuel cells was not considered. And as you know with the Air Resources Board transit bus rule incorporating on the diesel fuel path the zero emission bus requirement, pushing forward fuel cell technologies in the heavy duty sector, and also the work with Excelcius, I was surprised not to see it. And I was hoping that it would be incorporated. And if you can comment on it.

MR. FONG: It isn't part of our current analysis. I think that we see a major focus in developing an attractive vehicle for light duty applications. And that that's sort of the larger potential market at this point.

Yes, you're correct that at some point, once that basic drivetrain technology is developed

and it proves itself, then it may well be a competitor in the heavy duty truck market.

At this point we're not including it in our strategy, although you're certainly welcome to make your recommendation to us and provide us with the information as to how that particular scenario might be developed and, you know, give some assistance to us on that, you know, making a credible and plausible case for that option.

MR. CAMPBELL: I guess I would build on that and ask, you know, what is the strategy or the timetable for your strategies that you're laying out in your document? Is it just simply ten years, or is it looking at 20 years, or --

MR. FONG: No, the --

MR. CAMPBELL: -- what's the timeframe?

MR. FONG: -- legislation specifically called for 2010 and 2020. We believe though that because the transportation system in California takes such a long time to reflect change that we really ought to be looking beyond the 2020 timeframe for this overall strategy that we might put forward.

And so we are also looking at a 2030 timeframe. And then if you captured the

presentation by Mr. Wuebben, an even more exotic 50-year timeframe.

So, you know, the future could be whatever you want it to be.

(Laughter.)

MR. CAMPBELL: Well, then I would suggest that it would be very appropriate to consider that option then.

MR. FONG: Thank you.

MR. WHEELER: Just for the record on European standards, there is no European country which has currently a standard 2 to 5 parts per million. The European community just yesterday announced 2005 objective of 10 to 15 before the year 2005, which would be comparable to our 2006.

MR. FONG: Thank you.

MR. HINDERKS: Mitja Hinderks, Litus. Getting back to the thorny question of diesels, for passenger cars and light duty trucks, when emissions were first proposed for gasoline engines, the average muscle cars of the '60s was as dirty per mile traveled as diesels were.

And we've done a great job, I think, of cleaning up these gasoline engines. But for various reasons, maybe the strength of certain

lobbies, nothing was done about diesels until very recently.

And now Californians are rightly concerned about the health effects of diesel pollution, but they've gone from no, maybe lax or no regulation to what are considered very tough standards.

And it's my understanding that certain manufacturers have opted not to enter the California market.

So there are very clean diesels out there, but they don't quite meet these standards, so they're not being offered here. I believe that's the case with VW; they offer diesel engines for some of the vehicles outside California, but not here.

So that means, in effect, California is losing out on the possibly considerable benefits of having a clean modern diesel. In a passenger car situation, as you say, it's 40 percent efficiency improvement, but for these SUVs and for these heavier vehicles I believe the efficiency improvement is greater because of the total characteristics of the diesel.

So, is there any thought in California

to find some way to encourage and bring back the corporations and manufacturers who are developing really clean diesels, and that might include deferring the standards for a year or two. Because I think it takes time to develop these technologies, and it may be unreasonable to do what took 40 or 30 years for gasoline engines, to do that in five years for diesels.

MR. FONG: So your question, I take it, was are we considering the potential change in emission standards that might improve the market opportunity for light duty diesels?

I think in our current analysis we're assuming, as I stated, that that technology will, in fact, meet emissions standards here in California. We already see some early prototype work. Ford Motor Company, for instance, has introduced, or has approached the agencies here in California with a vehicle that will meet that 2007 emission standard.

No one could have imagined back in 1990 that current gasoline technology would be as clean as it is today. And so for those of us who work in this sort of crystal ball job that we have, I would say that given enough time and money,

technology will advance and prove itself to what is required.

I don't think there really is some inherent limitation in any of these technologies. There is going to be essentially a question, will the consumer be willing to pay for that performance level.

MR. EMMETT: Hi, my name's Daniel Emmett. I'm with Environment Now Foundation. Interesting stuff, thank you very much.

I just have two quick points about the fuel cell strategy. With regard to hydrogen sources I'm interested in a third source, and I'm wondering if you are going to be looking at that, and that would be water and electrolysis. I don't know if it's just costs that you're looking at there, but I know there are a few companies that are working on this successfully. And I would suggest that to add to your study.

And also if you're looking at CNG for home refueling, I would suggest also a similar application could be applied to fuel cells, as well, as an option for refueling at home. If they have those onboard reformer technologies.

MR. FONG: Thank you.

MS. MONAHAN: I'm Patricia Monahan from the Union of Concerned Scientists. And thanks, Dan, I hope you don't feel that too many people are coming up here shooting arrows.

I have a few comments. First, I just want to reiterate some of the concerns that Roland raised about assuming that the '07 standards are sufficient for diesel passenger cars. And assuming that the technology is going to exist to reduce emissions sufficiently from diesel vehicles.

Along those same lines I was also concerned to see that the infrastructure, it was presumed that there would be a public/private partnership for the urea infrastructure for the selective catalytic reduction technology in it. I think right now we can't say that that is, indeed, going to be the case that urea is going to be the reductant that's going to be selected. And that SCR technology is definitely going to penetrate the entire system in terms of getting the NOx reductions necessary for the '07 standards.

So I would say that there should be some infrastructure costs built into that. And from what I hear from the heavy duty diesel folks,

there really isn't a certainty that that is, indeed, going to be the technology of choice or the reductant of choice.

In terms of other heavy duty issues, I'm wondering if you all are looking at the potential for using fuel cells for auxiliary power units, and what might be the potential diesel reductions from that.

And also I don't know if this is a fuel efficiency or fuel displacement strategy, but idling trucks, as well, if there's some consideration for what kind of reductions you could get from standards to reduce the amount that trucks idle.

And then lastly, sorry to give you a barrage of issues, but I'm wondering about the natural gas incremental cost difference. You said that you were going to base your analysis of costs on historical trends. And I'm wondering if there is a reduction in costs over time as you get more vehicles on the road and incremental costs are reduced. Is that factored into the model?

MR. FONG: Yes, for the heavy duty vehicle case, when I said that we used historical trends, that is a downward trend, and so we

extended that downward trend out into the future to estimate what the incremental costs might be in those timeframes. So it does come substantially down from what it is today.

MS. MONAHAN: Okay, thank you.

DR. LONG: Russell Long, Bluewater Network. Two quick things. One is in terms of fuel use by vessels, by large marine vessels, I see the residual fuel content is relatively high, and that might be another area to target in terms of a strategy that would require vessels to reduce their speeds operating in state waters. I'd like that to be considered if you think that would be viable in terms of reductions.

And the second point, you know it concerns me a little bit that the point of this report is to focus on petroleum reduction when, in fact, the real problem is greenhouse gas emissions. And to the extent that some fuels such as natural gas, which are cleaner certainly in terms of reducing smog and improving air quality, some of those fuels like natural gas may actually increase some of the greenhouse emissions on a net life cycle basis.

There's been some interesting work done

at Argonne National Labs by Dr. Wong that indicates, in fact, probably comparable greenhouse gas emissions on a life cycle basis to gasoline, and probably a little bit higher than diesel. So I'd ask that to be taken into consideration. Not to disparage natural gas, because obviously there are certain benefits that we can't afford to ignore.

Thanks.

MR. FONG: The analysis that we're going to combine at some point takes into account those issues that you've discussed. Keep in mind that the work that we're presenting today is focusing on the direct consumer benefit elements.

The environmental elements are going to be included in the final outcome. And you'll hear a presentation about those elements in February.

MR. WHITEHEAD: My name is Doug Whitehead; I'm with the National Biodiesel Board. I want to thank you for this opportunity, and thank you for the inclusion of biodiesel in your presentation.

I wish to make a few additional assumptions and a comment. One is using biodiesel, there's no loss in power or

performance. And up to a B20 blend there's no need for engine modifications.

Also, there's no reduction in the tax base because biodiesel is taxed at the same rate as diesel fuel.

The last, then, is, you know, based on the demand of biodiesel here we feel confident that additional refineries will be established in California.

And my final comment was in your notes here you have a 75-cent to $1 per gallon incremental cost over diesel fuel. And we've seen that cost come down. We've seen some anomalies, but we think that it's becoming about 35 cents per gallon higher than diesel fuel.

And, again, thank you for allowing me to speak.

MR. FONG: Yeah, if you have information that is usable regarding the cost elements for biodiesel, please make that, you know, bring that in to us to that we can use it.

MR. WHITEHEAD: Right, thank you.

MR. LUCAS: Hi, Dan. Bob Lucas, California Counsel for Environmental and Economic Balance.

We're quite interested in what you're doing from a methodological standpoint. And I know that in your slide on scenario methodology you made a point of saying you wanted to have consistent points of comparison.

And I wanted to urge that you do your best to do that and to differentiate as best you can the differences in the stages of development, not only the vehicle technologies, but the fuel infrastructure requirements, as you go along.

In looking at your slides you have, there's a different combination of commercialization, public/private investment, public investment and private investment, it doesn't say one or the other. What I would suggest that you might take a look at is consideration of the stage of research development demonstration versus commercialization when you're looking at costs. And you also try to assign those values in the timeframes of which you think they will occur.

You know, when the rubber hits the road here we're all going to try to do our best to compare these things and look at them and make some judgments. And this, I think, will help.

Thank you.

MR. FONG: Thank you. We understand that to do a present value cost/benefit analysis you do have to make assumptions of when those benefits occur and when those costs occur in order to generate an accurate outcome.

So we understand that, you know, to do this correctly you have to make those kinds of assumptions.

MR. LUCAS: Well, one of the essences of my comments is also the nature of the cost and the nature of the investment. It's more than just the time. The timing is very significant, but also to the extent that you can differentiate between what's required for the research and development and the demonstration versus the full commercialization.

In fact, on the infrastructure if you could even anticipate some lead time for that, that might also be helpful.

MR. FONG: Thank you. We're going to take a few more questions before we take a break.

MR. WONG: I don't know if it's allowed, but I'm going to double-dip here and speak to a different issue, the battery electric vehicle

assumptions.

Roland Wong, the Natural Resources Defense Council.

The issue is I think when we're looking at the battery cost, if I understand your cost assumptions correctly, you're probably looking at the battery panel costs, you're looking at nickel and metal hydride technology, and how that will come down with mass production by the 2010 type timeframe, order of 50, 100 -- a year.

I think when we're looking, certainly when we're looking beyond 2010, certainly we are looking at some very aggressive scenarios in petroleum reduction, we would hope. And also looking at advanced technologies, that we also will get advanced batteries. And the potential for other batteries, like lithium ion, lithium polymer to also come in perhaps in the post-2010 timeframe, perhaps even sooner given the right conditions.

Those batteries also have a potential to go below nickel metal hydride just based upon the cost of the materials that go into it. So we're looking at something of a longer term cost and perhaps lower than $150 per kilowatt hour.

The second thing in terms of the battery vehicle costing is that obviously a lot of the strategies currently the automakers are employing, a lot of them are looking at shrinking down the battery pack and building smaller vehicles like city cars. Vehicles that, you know, currently do not have a very robust market niche in the United States.

But, again, if we're looking at a long-term future I think we should look at a very different type of transportation infrastructure, one that could perhaps integrate a lot of the concepts like smart growth compact development, reducing the need for longer range vehicles and creating a better market.

So I think we can envision a different transportation system where a battery electric vehicle new technology and different kinds of vehicles could -- the answer you would get when you analyze that scenario would be very different if you'd just look at it a nickel metal hydride straight up full functioning.

MR. FONG: We understand, thank you.

MS. JONES: I'll make this quick. Pam Jones, Diesel Technology Forum.

Just wanted to encourage you to take a look at the IEEE, the Institute of Electronic and Electrical Engineers report. I think it was March of last year, 2001, they did look at the strategies you're talking about and did cost/ benefit analyses, as well as kind of a well to wheel environmental analysis.

I'll follow up and provide that to you, but it's quite insightful on some of their findings.

MR. FONG: Thank you. If there aren't any more questions we're going to take our scheduled 15-minute break, so we'll be back here at a quarter after 3:00. Thank you.

(Brief recess.)

MS. BROWN: I expect this to take roughly half an hour, and then we'll have time for questions at the end. And a few remarks on what next on the entire project.

So at this time I'd like to introduce Chris Kavalec, our staff economist, who will be talking about pricing strategies.

MR. KAVALEC: What I'm presenting here is the results of various pricing strategies that we looked at, that we analyzed. And here they

are.

We have a gasoline tax, pay at the pump auto insurance, a tax on vehicle miles traveled, feebates. That was actually proposed a few years ago in the form of DrivePlus in California. A transfer of registration fees from a fixed cost to a variable cost. And purchase incentives for efficient vehicles.

What I'm going to do here is to give more in-depth results for two of these strategies, pay at the pump auto insurance and feebates. So we'll start with pay at the pump auto insurance.

In this analysis what happens is that the minimum legal liability portion required by law of auto insurance is paid through a fuel surcharge. The assumption for that cost was $250 per vehicle, and that is an estimate.

The actual amount the companies charge for minimum legal liability differs widely. The range I found was something like $150 to $400.

And mechanically what happens is that we converted that $250 to a per mile charge by dividing by the average mileage of California motorists. And then converted that to a fuel tax which came out to be 45 cents per gallon. So

that's a variable charge, a marginal charge that's meant to cover the minimum legal liability portion of auto insurance.

The key assumption being made here is that at least some portion of accident risk depends on the amount of miles driven. That is that the risk of an accident is directly related to vehicle miles traveled.

An advantage of this strategy is that driving and gasoline demand are reduced while private costs to insured motorists do not increase. It's just a transfer from fixed to marginal.

In fact, as we'll see, there are actually positive net benefits to Californians from the strategy. And as with all these pricing strategies, except for the last one, they were simulated using the CalCars model.

This is out of order. This gives a summary of the results for all of the pricing strategies. The gasoline tax, pay at the pump, and the VMT taxes were the highest reducers of gasoline demand, which with purchase incentives having more of an impact in later years.

And here's another look at the gasoline

demand reductions from pay at the pump auto insurance. The reductions increase over time because the fuel surcharge causes drivers to buy more fuel efficient vehicles so the increase, the demand reduction increases over time.

And next is the net consumer benefits. Again, this does not include the impact on government revenues or the environmental impacts. This is a net present value with 2002 as the benchmark, so the first entry there is in millions of 2001 dollars net present value of net benefits from 2002 to 2010. The next one is from 2002 to 2020, and so on.

And as you can see, they're positive. There are net benefits from this strategy. And what this is demonstrating what's going on here is that if a portion of accident risk is, in fact, related to miles driven, and vehicle owners can pay for this risk through a marginal charge, rather than a fixed cost, net consumer benefits are positive.

This is just an example, an applied example that a text book in economics 101 will tell you. This is an improvement in economic efficiency for this good, which in this case is

auto insurance.

The next strategy is feebates. Feebates, some of you may know, is a system of fees and rebates applied to the purchase price of new vehicles, in this case in California. And it is meant to be revenue neutral. That's one of the advantages of it.

The total amount of fees collected can exactly equal the rebates for more fuel efficient vehicles.

The range of the feebates is zero to $5000 based on carbon emissions per mile. Since our fleet is mainly gasoline in California, this feebate works like a feebate based on miles per gallon.

So in other words, the large SUVs are going to be the ones paying around $5000 while the little minicars will be receiving a rebate of around $5000.

Key assumption here there is no change in vehicle choice, the vehicles offered by the manufacturers. And finally, again, CalCars model was used.

Gasoline demand reductions not nearly as high as the pay at the pump case. But again these

increase over time as more and more of the fleet is affected by the feebates. In the first year only new vehicles are affected. The second year new and one-year-old vehicles and so on down the line. So it increases over time.

And the net consumer benefits again excluding environmental and the impact on government revenues. Net present value from 2002 to three years. And as you can see that these results for net consumer benefits are negative. In fact, there are net costs for a feebate system for consumers.

And this doesn't necessarily mean that total net benefits when all is said and done will be negative. Once we add in the environmental benefits we could end up with a positive result. But we haven't done that part yet.

Now, --

MS. SPELLISCY: Would you elaborate on the cost to the consumer factored in there?

MR. KAVALEC: I'm sorry?

MS. SPELLISCY: Could you elaborate on the consumer costs that were factored in there? You said there's a net cost to consumers --

MR. KAVALEC: Yeah, what's basically

going on is that, what explains these negative benefits is what economists would call an intrusion into the free market.

When you have a relatively free market where prices are determined by the market, and they represent the value of the good, and they represent the cost of producing that good, if we, the government, come into the market and artificially change prices, we impose net costs on society.

Maybe a more intuitive way of looking at it is the benefits to the buyers of more fuel efficient vehicles are lower than the costs to the buyers of gas guzzlers. Even though it's revenue neutral.

So, I guess as an example, let's say I'm choosing between a gas guzzler and a fuel efficient vehicle, and the value that I place on the gas guzzler is $500 more than the fuel efficient vehicle. And this is before any feebate.

So I would choose the gas guzzler. Now, say a feebate comes along of $1000, so the fuel efficient vehicle is now $1000 cheaper, okay. I will now purchase the more fuel efficient vehicle.

However, I'm only $500 better off than I was before the feebate, because there was that discrepancy in value of $500 previously. So the net benefits to me are only $500. However it costs society $1000 to do that. That's why the net benefits are negative.

Okay, so those are the two that I'm giving details on. There are three other ones left. The first is the ever popular gasoline tax. A 50 cent higher fuel tax per gallon. What happens is it obviously reduces driving because the cost of driving goes up. And it also creates an incentive to switch to more fuel efficient vehicles. And, again, the CalCars model was used to simulate this.

Next, tax on vehicle miles traveled. This is a tax of 2 cents per mile charged to drivers in California, collected through some means that we haven't defined. It reduces driving and gasoline demand, but unlike the fuel tax, it doesn't create an incentive to switch to more fuel efficient vehicles. So in that sense it's not as effective as the gasoline tax.

And finally we have the registration fee transfer. Here a portion of registration fees

that we pay every year is paid through a gasoline surcharge, similar in concept to the pay at the pump strategy.

The key assumption here is that a portion of the expenditures that come through registration fees is proportional to driving, to mileage. So what I did here was I took the portion of total registration fees going toward highway uses and maintenance and services, which translated to roughly $50 per vehicle, and then I turned that into a gasoline surcharge just as I did with the pay at the pump strategy.

Okay. Those are the pricing strategies. I'd be happy to take any questions.

MR. POHORSKY: Hello. Jerry Pohorsky from Santa Clara. Two things. You didn't really talk too much on the electrical vehicle benefits, although I am partaking of those. I'm receiving essentially half of the normal lease payment on my electric vehicle courtesy of a program that was recently enacted. So rather than paying $424 a month for my electrical vehicle that I was paying previously, now I'm only paying $209 a month, and I appreciate that.

Another benefit I'm getting is I can

drive in the commuter lane with just a single occupant now, and that costs me $8 at the DMV for that privilege. And it also got me across the bridge today for free, rather than paying a $2 toll like everybody else.

But regarding things like a 50 cent a gallon tax, for a normal consumer that might have some benefit, but for a businessperson, a delivery type of a business they'll probably pass that on to their customers, and it may actually have some negative effect on the business world. So you might think twice there.

MR. KAVALEC: Yeah, that is a good point. That's one of the reasons we're using the general equilibrium model to look at impacts on the economy.

If I may, there was one I missed here. And that was purchase incentives for efficient vehicles. And this is fairly simple. It provides buy-down incentives to encourage the purchase of the most efficient vehicles available in a given class. It assumes a $1500 vehicle incentive, $1500 per vehicle. And the benefits include the lower amount of fuel savings. And for those that buy the vehicles, obviously there is some portion

of that $1500 will be a benefit to them.

Okay, any other questions?

MS. SPELLISCY: Sandra Spelliscy with the Planning and Conservation League.

I noticed that you didn't do the net cost to consumer calculation on those last, the incentives for efficient vehicles that you had done for the others. And I wasn't sure why.

MR. KAVALEC: Not yet completed, I hear.

MS. SPELLISCY: And I guess this is more of a comment than a question. I still did not understand your explanation about net consumer benefits. And frankly I don't think a lot of people in the audience did, as well. And I just am really concerned about moving forward with this basic premise here and these kinds of numbers that I understand we're going to also add into some other numbers down the road.

But I think we need to find a better comfort level about what it is we're talking about here before we move forward onto the next step, because I didn't get it, and I have a feeling a lot of other people didn't get it, either.

And I'm not sure that, you know, I'm not trying to put you on the spot for that

clarification today, but I've seen this as a major area of concern and perhaps weakness right now that we need to focus on.

MR. KAVALEC: Well, one thing, I guess one other -- one more try at explaining it is you have a system of taxes and subsidies. And taxes and subsidies impose what are called distortions, costs on the market. I mean that's what's going on basically.

As far as the assumptions, a key assumption here, as I mentioned, was that we're not assuming any manufacturer response to a policy in California. That may not be true.

In a nationwide case, if it were a nationwide feebate case you would certainly have manufacturer response. And there was an analysis done a few years ago at Berkeley that showed that nationwide feebates can actually have positive consumer net benefits.

MS. SPELLISCY: Well, are you saying that part of the reason why there's not a positive consumer benefit is because the assumption that there's no manufacturer response means that there's no additional choice in terms of -- no additional vehicle choice created by the feebate

system?

MR. KAVALEC: That's right.

MS. SPELLISCY: But what about the fact that there are other regulatory programs that are increasing, that will have an impact on vehicle choice, and so that's already going to be out there? In other words, because of the ZEV program there's going to be a far greater choice of, you know, among fuel efficient or high fuel economy vehicles or low polluting vehicles and that sort of thing.

MR. KAVALEC: Yeah, although that would be part of our basecase forecast. And these are results relative to the basecase forecast.

To finish that up, it is, as I said, it is possible that automakers would respond to a California-only policy to some degree, because California's a pretty large market.

MS. SPELLISCY: Yeah, they certainly have responded in other instances.

MR. KAVALEC: Right. So we are considering looking at another case.

MS. SPELLISCY: That's the basis of the allowance under the federal Clean Act to allow California-only policies in terms of pollution

control because of the size of the California market and the ability of manufacturers to respond specifically to that.

MR. KAVALEC: So we do plan to consider that case, as well.

MS. SPELLISCY: Okay.

MR. KAVALEC: Don't make me try and explain that --

(Laughter.)

MS. MONAHAN: For the record, Patricia Monahan from the Union of Concerned Scientists.

Thanks for your presentation, Chris, it was very interesting. And I have a few of what I hope are rather basic questions, or maybe they're actually recommendations for future research, I'm not sure.

But I'm wondering in terms of the manufacturer response, has there been any attempt to quantify what percentage of the market would have to be involved by the feebates in order to have manufacturer response?

MR. KAVALEC: Not that I know of, not that I'm aware of.

MS. MONAHAN: Um-hum, because that's one of the limitations of just looking at a

California-only, particularly when there's no -- when the consumer preference model shows no manufacturer response, is to look at well, what if California were the first of many states. I mean other states are looking at feebates, so what if this, you know, we could actually influence the national market by having other states join in on the feebates. So that's --

MR. KAVALEC: And that's another justification for assuming automaker response, is that California policy causes other states to use the same strategy.

MS. MONAHAN: And then a basic question, I'm sure I just didn't understand the analysis. But you said for an incentive for a fuel efficient vehicle would be $1500. And that the gasoline petroleum reduction from the incentives would be greater than the petroleum reduction from feebates, even though the feebates are much much higher, up to $5000 fees and rebates per vehicle.

So I'm just trying to understand why when the amount would be so much greater with feebates in terms of the difference in vehicle costs, would the actual petroleum reduction be less with feebates.

MR. KAVALEC: I guess I can't answer that right now since I didn't do the vehicle incentive portion. I would have to look at that more closely.

MS. MONAHAN: Thank you.

DR. McCANN: Richard McCann with M.Cubed. First question on the pay at the pump auto insurance, you assume 45 cents a gallon. Did you make adjustments into the future as the VMT per gallon increased in order to keep the insurance fund fully funded?

MR. KAVALEC: Yes, so the tax -- 45 cents is sort of an average. It varied up and down in different years. Yeah, but I did try and balance that.

DR. McCANN: Okay. Second question, I do understand how the feebates system and the economy worked, and actually I just want to point out to the engineers in the audience that when economists talk you fall asleep, and when the engineers talk the economist fall asleep.

(Laughter.)

DR. McCANN: So, as economist to economist, we'll have this conversation and you can all go to sleep.

(Laughter.)

DR. McCANN: The one thing on the feebate program, in terms of -- one thing I'm a little interested in finding out how you developed the schedule of fees that you -- I mean did you come up with a schedule, iterate to try to find out where it was, or just impose the fee schedule based on what you thought might work?

MR. KAVALEC: What do you mean by what might work?

DR. McCANN: Well, I mean how many -- did you try iterating the model in order to come up with a feebate schedule that might reduce the negative costs or achieve some goal? How did you come up with the feebate schedule that you put into the model?

MR. KAVALEC: Well, it was based on an amount of carbon emissions per mile.

DR. McCANN: Right, but how did you come up with that?

MR. KAVALEC: That was based on a damage cost of carbon of number of escapes -- now of $35 per ton, something in that area. That's where it came from initially.

DR. McCANN: Now is that number going to

be linked to -- is that a number we should expect to see in the task one study of ARB about --

MR. KAVALEC: Not necessarily.

DR. McCANN: Huh?

MR. KAVALEC: No, that was only for this particular case. That's --

DR. McCANN: It would seem that they would have to be linked. That whatever you're doing needs to be linked in that process.

MR. KAVALEC: Yes, and they will be at the end, yeah.

DR. McCANN: Okay. The other thing was that, which was a little bit of a concern, although maybe this is explained by the carbon tax aspect, was that the feebate program showed a negative benefit while the fuel economy improvements showed a positive benefit.

And from an economic standpoint, as long as -- it would seem like -- now, I don't know on the purchase incentive what the number would be, but it gets back to actually a little bit broader point that I wanted to make, which is that for some of these, in general I think that what might help in terms of looking at these strategies is rather than trying to derive the cost of achieving

a particular strategy, so that you get into a fight over the cost of the strategy, that you actually figure out what the break-even cost is for the strategy.

What are the benefits from the strategy, then looking backwards, what is the cost that you need to achieve in order to get to the point of which the strategy is break even relative to the benefits.

So that then you can decide is that break-even cost actually quite a bit higher than where we expect the cost to be; or is it quite a bit lower than where we expect the cost to be. So that you approach that in a little different way of addressing this problem, rather than getting into a fight about, well, is the fuel economy strategy, for example, going to be $800 or $1500.

Maybe the break-even cost is $2000 or maybe it's $1000. But if we get -- it makes it a little bit broader set of questions to address. And I think that maybe that analytic approach permeate the entire approach to this entire study, setting that out rather than getting into individual costs.

Because I know that just looking at, for

example, the pricing strategy. The way that I would approach the pricing strategy question is I would set these prices at a point which I think the net benefits are zero, basically. Because that would mean that society is indifferent between that price and whatever other aspects that we're dealing with, the tradeoffs within society. So that that would end up in a marketplace you would expect those sort of things that the net present value difference or benefits would be zero between two competing strategies in which people are making choices, direct choices.

So, I think that may be in the pricing strategy that that same approach should be used. Set the feebate schedule basically so that you had a zero benefit; set the purchase incentives so that you had a zero net benefit, et cetera. And also do that in terms of when we're ranking various strategies so that we come out that way.

And the only other point I wanted to make was something a little bit related to what Dan Fong said earlier is that I know that you're putting up net present value estimates for different things. And one question is what discount rates are you folks using in that

analysis? Are you using the 5 percent or 12 percent?

MR. KAVALEC: The ones that I've been showing use 12 percent. I think all the ones we've been showing use 12 percent, yeah.

DR. McCANN: But one thing is that in some cases you're going to find strategies that have positive benefits at a 5 percent discount rate. And other ones they have a positive -- and they have negative benefits at 12 percent.

Does that mean that then we should consider market interventions in which the private benefits wouldn't justify choosing a strategy, but social benefits would justify choosing a particular strategy. Then does that mean that the state government should think about throwing money, basically throwing money into the pot in order to get the difference of the benefits up to 12 percent? So that they --

MR. KAVALEC: Yeah, I guess that's --

DR. McCANN: -- so they clear the 12 percent discount rate.

MR. KAVALEC: What we intend to do is just present the results, and let others make that type of decision.

DR. McCANN: But I think that one of the options that the Energy Commission and the ARB should mention in their policy document, which the legislators won't, honestly they won't think about it, because we have two economists talking up here, and the legislators fell asleep while they're reading the report, is that they may not consider the fact that that incremental cost difference that arises from the net present value between two strategies is based entirely on the discount rate. That they should think about that strategy.

It's not that the Energy Commission would be advocating that strategy. I think that they should think about presenting that strategy as part of implementation.

MR. KAVALEC: Thank you.

MR. CAMPBELL: Todd Campbell, Coalition for Clean Air.

I just want to highlight a little bit on the gasoline tax. And propose the consideration of a petroleum tax. It's, you know, I think both diesel and gasoline should be considered when you're looking at taxing fuels or taxing petroleum, you know, across the board.

The other question I have is how did the agencies arrive at a 50 cent tax versus, you know, a range of other options? And I guess where I'm going with this is that why aren't we considering more aggressive taxes in this area?

There is the Highway 1 section today in The L.A. Times discusses how in 1980 we were paying $1.41 per gallon for gas, where the per capita was roughly around 11,800. Today the per capita is around $28,000 as opposed to $11,000 in 1980, and we're paying $1.11.

I guess my point is is that gas is extremely cheap and 50 cents doesn't seem to me aggressive enough. And I'm hoping that you will be considering more options than just 50 cents.

MR. KAVALEC: Well, to answer your question, the reason that -- that 50 cents was just arbitrary. It could have been a dollar. It could have been 20 cents.

One problem is if you go up too high, at least in the methodology that you're using, you get into areas that people aren't used to. Our consumer choice models are based on what things people are familiar with. So it's hard to predict the impact of a $4 gasoline tax, for example.

Because people aren't used to paying -- they haven't had any experience with paying, you know, $5 a gallon.

So that's why I chose something relatively low.

MR. CAMPBELL: Will there be in the report any kind of consideration? I mean I presume that, you know, you're going to use the report to eventually lead into a policy direction. Would it be helpful to look at several alternatives to see what kind of reductions in petroleum use that we would achieve?

And then also, you know, it may not be of the same tax for diesel; it may be a different tax entirely. But, you know, I'd like to -- you know, it would be relevant to see what kind of alternatives and variations, you know, in these taxes, as well as, you know, what can be achieved in terms of the reductions.

MR. KAVALEC: Okay, thanks. We'll consider that.

Okay, no more questions, I'll present Leigh Stamets, who's going to present other strategies.

MR. STAMETS: Okay, well, I appreciate

you all staying here. I hope I'll make it worth your while.

So the other strategies, and we're going to be -- four strategies we're looking at. One is where there would be additional funding to cause expanded use or allow expanded use of public transit.

Another one the land use planning where there would be incentives and additional information such that we would be smarter in our land use planning, at least as far as transportation reduction is concerned.

Telecommuting would be again a case where the strategy would be incentives and information of perhaps successful telecommuting programs to encourage expanded telecommuting.

And reducing speed limits would simply be reducing and enforcement of lower maximum speed limits.

This shows a summary of the relative impact of these strategies. The expanded use of public transit relates to -- we're presently about 1 percent of the passenger miles traveled in the street are on transit. And this is presuming that by 2020 we double that to 2 percent of the riders

of the passenger miles traveled in the state would be transit.

That's why I consider this a long-term option. I didn't attempt to evaluate a number for 2010.

The land use planning was based on some work that Parsons Brinkerhoff did for us. I'll say a little more about that later, but it's basically identifying that we could, through some smarter planning, reduce our VMT by 3 percent in this particular numbers I'm showing here.

The telecommuting professor Pat Mutarian of Davis has done an extensive amount of work on telecommuting. So our previous modeling work I found kind of surprisingly. Probably to us, at least intuitively, is that we weren't getting much reduction in energy use or VMT over the long run due to present telecommuting. She did some more survey work for us and -- or she did some more analysis of VMT data and that conclusion still holds for the most part.

We found there was perhaps somewhat less than 1 percent approach improvement due to telecommuting. And this shows if that effect was doubled for one of her cases.

And then finally reducing the speed limit is where we would have a 55 maximum speed limit, and reduce the fuel economy overall by about -- or fuel use by about 1.5 percent.

As I mentioned, we were looking at the increase in transit use as one of the majors. It's about 1 percent of the passenger miles, as I mentioned. And unfortunately, perhaps, it's grown less than about 1 percent. The ridership has grown less than about 1 percent per year since 1980.

To achieve a 2 percent level we would have to have a growth in ridership of about 5.4 percent, and that's because the VMT with cars is increasing all the time, too. So that's, you know, it would be a real test to resolve to achieve that level.

But, of course, there are many other advantages to transit ridership, and increased use of transit besides just the energy considerations.

And this, once again, shows the advantage of doubling the ridership, the percent of passenger miles traveled, by 2020. And then continuing that growth rate on to 2030.

Regarding the land use planning, we

contracted a small contract with Parsons Brinkerhoff. They conducted a survey with primarily the NPOs throughout the state and got a fair number of responses with regard to what analysis with their transportation models they had used, and planning models, to analyze what might be the advantage of better land use planning.

And it turned out there was kind of, you know, different NPOs had looked at different measures. And so Parsons basically compiled those and developed estimates as to if you took what different groups had done within the state, spread them across the state, taking cognizance of the point that there are certain areas that have very mature metropolitan areas; there are other areas where there is much growth going on, and so there's actually a better opportunity for land use planning in that case.

And so then when they looked at all these various results and compiled them on an across-the-state basis, they came up then with this that there's potentially a 3 to 10 percent reduction in VMT that could be achieved with basically smart growth or land use planning.

A substantial amount of this variation

reduces depends on the analysis with regard to the city-centered land use development and the land use development focused on transit stations. In other words there was a good bit of perhaps very valid variation among different metropolitan areas as far as what they would expect to achieve from that policy.

And then the others are the market pricing primarily looking at parking. And then the job/housing balance had somewhat smaller effects.

And this is again for the 3 percent case, and the reason it's less than 3 percent is because this is a number based upon diesel use, also. So it's basically a percent reduction in gasoline as compared to gasoline and diesel use, at least the way I calculated it.

And this just once again briefly presents the results on the telecommuting, in that basically the information shows that there's just not much long-term impact from telecommuting. And I think probably my conclusions from all of this is that one thing is it's probably important to really get better data on telecommuting because the analysts are forced to work with a relatively

paucity amount of data.

On enforcing the speed limits, basically the data I used was got some data from SCAG that they were using as far as the percent of travel at different speeds. And then Oak Ridge National Laboratory, I think, did some look at the, I think they were 1997 cars or something of that vintage, as to how they affected their fuel economy based on speed.

And so I combined those, and this is an example of one of the numbers. If you go from 55 to 65 you're reducing your fuel economy or vice versa, if you slowed down you'd be improving it by 9.9 percent. And so applying that kind of distribution for basically looking at the cars that were driving above 55 and then seeing what the improvement would be.

There certainly was -- one of the things was that the data I had didn't show how many cars were driving 75 and 80 miles an hour which might actually increase this 1.5 percent of the fuel economy, of the fuel savings that I found.

That's it, thank you.

MS. BROWN: Well, that pretty much wraps up what we had to present, but I still want to

offer an opportunity to ask questions of Leigh or Chris, particularly Leigh on the last four measures. Mr. McCann.

DR. McCANN: Richard McCann. Two questions. One is is the Parsons Brinkerhoff study available?

MR. STAMETS: it will be.

MS. BROWN: We haven't placed it on the web yet. We're taking steps to do that.

DR. McCANN: Second question. When you're getting into reducing speed limits, have you or will you include the increased travel time, costs of increased travel time in your net benefits analysis?

MR. STAMETS: Certainly it would have an effect, although, you know, I think transportation, the design people, you know, I'm not sure how much effect, because in one sense high speeds tend to cause certain types of disturbances and congestion. And so let's say if I can find some information that seems, you know, kind of to fit the point we can include that.

I suspect it's rather complicated and I haven't done it yet.

DR. McCANN: Right, well, I guess one of

the things is that in terms of congestion, obviously congestion reduces you below the speed limit.

MR. STAMETS: Right.

DR. McCANN: So that the speed limit is no longer a constraint.

MR. STAMETS: But -- okay, well, let me look at that.

MS. BROWN: Another question.

MR. KELLER: John Keller from the Highway Patrol.

MR. STAMETS: Oh, good, there we go.

(Laughter.)

MR. KELLER: Certainly as part of your cost/benefit comparisons there'd be a cost to us involved in enforcing any sort of a lower speed limit. Most of us in the room here are old enough to remember the '74 energy crisis and the Arab oil embargo, and we had a 55 speed limit for many years. We had lots of studies of that experience.

So there will be safety benefits if you can convince people to slow down. And that's really the big question here. I mean it's fine to change the signs out there, but that doesn't change their behavior. And --

MR. STAMETS: You know, if there was one particular study we might just reference and take a few points from it might be helpful to put this into perspective. Because we certainly, you know, recognize the, although I'm not sure how thoroughly, but I certainly recognize that there are the issues there. And if there was a good document that sort of outlined the lessons learned from the past that would probably be good to include in this discussion.

MR. KELLER: Sure. There's --

MR. FONG: Would you accept a speed limiter on cars?

MR. KELLER: I'm sorry, a governor? Is that what you said, a governor on --

MR. FONG: No. Would you accept a speed limiter on cars?

MS. BROWN: A device --

AUDIENCE SPEAKER: A governor.

MR. KELLER: A governor.

MR. FONG: Yes, some device that might limit you to some top speed.

MR. KELLER: Are you talking about me, as an agency? Or me as a --

MR. FONG: Yeah.

(Laughter.)

MR. FONG: You as an agency.

MR. KELLER: I mean that's been proposed a number of times. Certainly there are lots of citizens who feel pretty strongly about that.

(Laughter.)

MR. KELLER: I think that a lower speed limit is within the realm of political feasibility, but it doesn't translate into compliance rates, which your model is based on, I assume, some significant compliance with that lower speed limit.

MR. FONG: Yeah, the --

MR. KELLER: So you just have to convince people to slow down. We can enforce at the margin, but unless you have that base of voluntary compliance, you know, it's the cost of changing the signs and then nothing else changes.

MR. STAMETS: So we'd probably need a lot of money for education or something I suppose.

MR. KELLER: Yeah. There was many millions spent from '74 through '86.

MS. BROWN: Thank you. Other questions?

MR. HINDERKS: Mitja Hinderks, Litus. It's late, so hopefully I'll be excused in making

a semi-frivolous or not entirely frivolous suggestion.

Amtrak is going belly up. Why doesn't California buy the local stuff; form the California Transportation Agency. The private model doesn't work as Britain has discovered. And then hire the French to build, using conventional technology, to build, as consultants, and build a couple of bullet-line trains.

The VMT would drop like a stone. And we would all -- I would love to have gotten the other day on a 160 mile an hour train. I just was in Las Vegas and there was a 300 mile long line of cars with one or two people in them. The Las Vegas gaming people will pay for the bullet train.

(Laughter.)

MR. STAMETS: Okay, yes, sounds like a good idea.

MR. POHORSKY: Hello. Jerry Pohorsky again one last time. It's got nothing to do with your presentation, but I did bring a little show-and-tell.

I've got a refueling station here in my briefcase.

(Pause.)

MR. POHORSKY: This end everybody knows what to do with. And then this other end plugs into the front of my car. I wish Chairman Lloyd from CARB was still here, because he wants to make this obsolete and go to a standard that's got an exposed metal contacts on it. This one's completely insulated and very user friendly.

One thing we didn't really talk about today is the user friendliness. If you use an ordinary gasoline pump you can spill it on the ground. I see them at CostCo all the time squirting this stuff on the ground after people top off and get it on the ground.

CNG, you know, talking about very expensive fueling for homes, and I don't know what the connector looks like. LPG, that's why I went to the full service place, because I wanted that guy to deal with the connectors.

So, something like this is user friendly; small package. The one on my wall in the garage is slightly bigger, but, you know, this I can plug in anywhere in the world practically and I can fuel, myself.

So, another incentive I wanted to mention. I'm getting free parking over here in

the City of Sacramento garage. And also free electricity.

MS. BROWN: Thank you, Jerry. Bob, do you have a comment?

MR. LUCAS: I realize that telecommuting isn't as sexy or as controversial as the other strategies that you looked at, but I'd urge you not to dismiss it lightly. It is a corporate cultural issue, and in all of our experience when it's been offered there are people that have taken advantage of it.

And it is going to be far less costly to implement than some of these others. And maybe in the long run more practical. So, just --

MR. STAMETS: What do you think government agencies should do to --

MR. LUCAS: Well, I'm not here to encourage a mandate, that's for sure. Although, you know, as you compile your list of incentives I certainly wouldn't encourage you to drop this off the items that you would incentivize, because if anything there's, you know, we think just looking through our own membership that there's a lot of potential for telecommuting.

So, again, not necessarily as a mandate,

but as an incentive. But, you know, if you're going to develop a comprehensive program we'd like to see this remain part of it. And not be dismissed too early. And, you know, perhaps you could have some more creative staff look at this.

MR. STAMETS: Okay.

MR. LUCAS: Thank you.

MS. BROWN: Thank you, Bob. I have the unenviable job of just making a few last minute remarks here.

Just in closing I want to thank everyone here for their participation. I think the discussion has been extremely productive. And we would welcome further input, not only on the strategies, but on the assumptions that we've presented.

We realize this is the first step, these results are partial results really. And when we get the benefits side of the equation done, I think we'll have a very meaningful discussion.

And with that I'd like to especially invite you to participate in the next workshop which is scheduled for February 19th, in which we'll be presenting the results of task one.

But in the meantime, please feel free,

and we encourage you to submit written comments to the docket on what we've presented today. There have been some issues raised. I'm sure there'll be some questions and issues on methodology, assumptions, strategies. We really need your feedback.

We don't have all the answers. We're doing our best to do a thorough and comprehensive analysis of these measures.

We are attempting to put a -- we're going to complete a staff assessment report which will document in greater detail some of the results you've seen today in a more complete fashion. Our target date for that is the end of this month.

I'd also like to request comments from you by the end of this month on what you've seen so far.

And check our website from time to time for information. These presentations you saw today, they'll be placed on the web. The results of the September 17th workshop will be placed on the web.

We have transcribed this workshop, so the transcripts will be available, I'm guessing,

within the next ten working days.

So, again, thank you. If there are any questions on process, ask them now, or check the website. Or call me, I'd be happy to talk with you about that.

Any last minute comments? Anything else? If not, this workshop is adjourned.

(Whereupon, at 4:13 p.m, the workshop was concluded.)

--o0o--

CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 26th day of January, 2002.

PETER PETTY